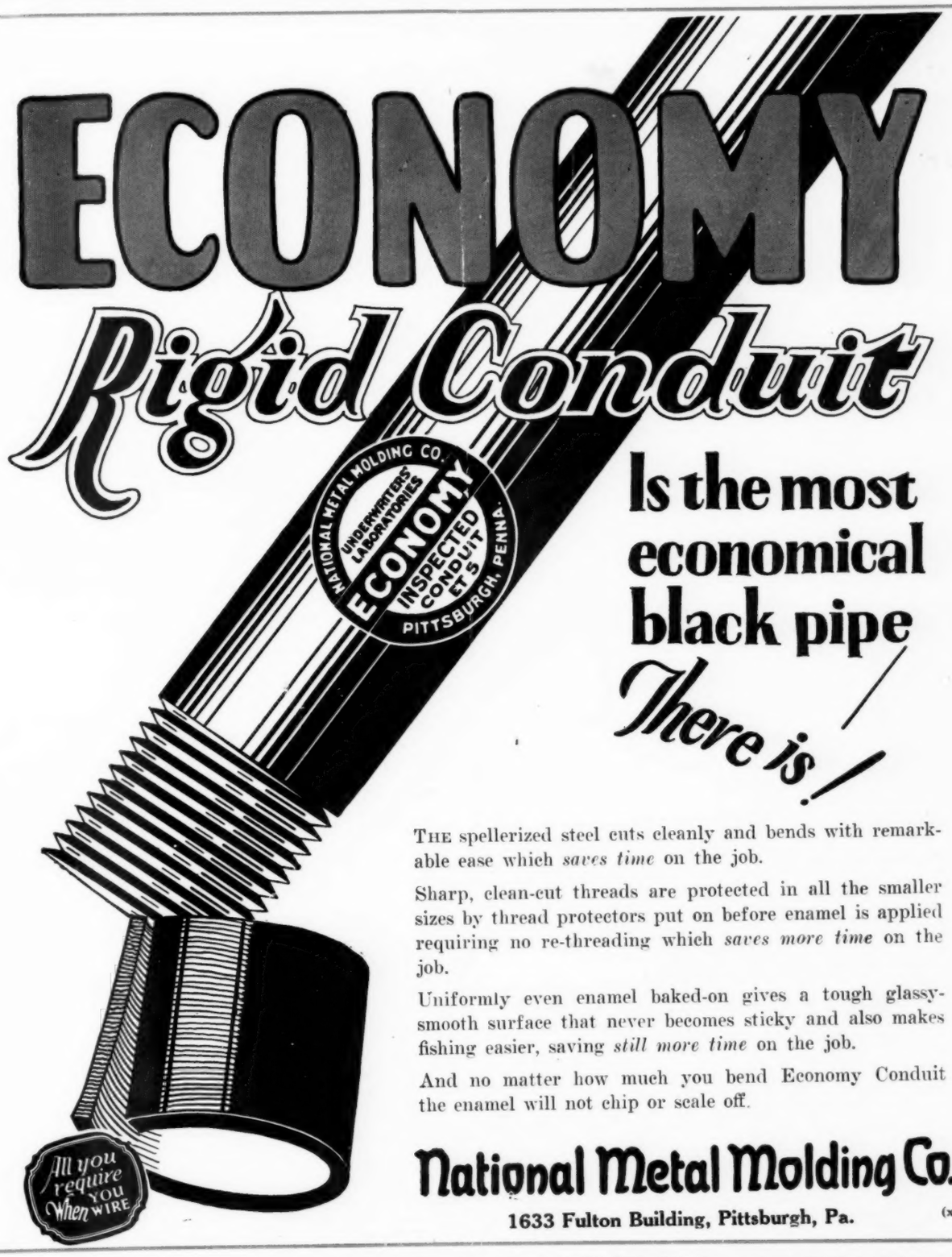
The Electragist

TRADE MARK REG. U.S. PAT. OFFICE

Vol. 25, No. 12 — Association of Electragists INTERNATIONAL — OCTOBER, 1926

ECONOMY
Rigid Conduit



Is the most economical black pipe *There is!*

THE spellerized steel cuts cleanly and bends with remarkable ease which *saves time* on the job.

Sharp, clean-cut threads are protected in all the smaller sizes by thread protectors put on before enamel is applied requiring no re-threading which *saves more time* on the job.

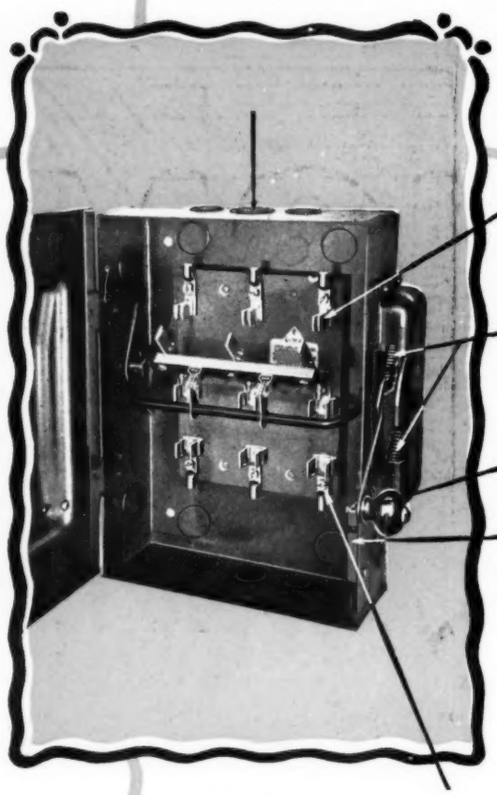
Uniformly even enamel baked-on gives a tough glassy-smooth surface that never becomes sticky and also makes fishing easier, saving *still more time* on the job.

And no matter how much you bend Economy Conduit the enamel will not chip or scale off.

National Metal Molding Co.

1633 Fulton Building, Pittsburgh, Pa. (x62)

Every Industrial Plant has use for this ▽ *Safety Switch*


Concentric Knockouts
Type A contact. The contact finger is of spring copper, sweated and pinned into solid terminal block.
2 heavy springs which operate switch.
Safety handle.
Interlocking device prevents access to fuse until they are dead.
Fuse clip terminals

Type "A" heavy duty ▽ Safety Switch

Made in all capacities. For general industrial use.

There are many safety switches, but this Type "A" heavy duty ▽ Safety Switch is built, not on a price basis, but rather to give the industrial plant a switch that will meet every requirement of service, for all time.

It is very ruggedly built and made to stand up under full load or overload conditions without breakdown. It will last indefinitely, and will continually guard the safety of employees. The installation of these switches is good insurance. A few of the important features are pointed out above.

We make meter service switches to meet the requirements of every central station thruout the United States.

There is a big business in safety switches among the industrial plants for dealers. Jobbers can be prepared for this business by carrying adequate stocks.

The ▽ line of safety and knife switches is complete.

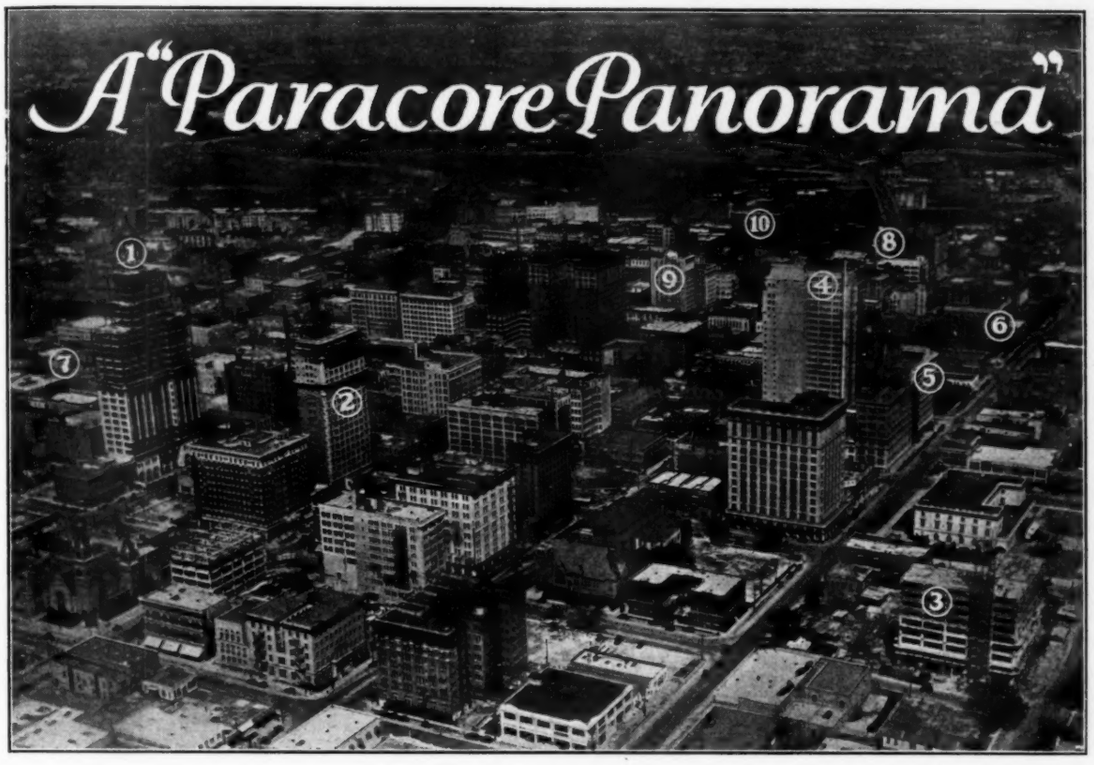
Type "A" closed. Fool proof and good insurance.

TRUMBULL-VANDERPOEL ELECTRIC MFG. CO.
BANTAM, CONN.

Complete stocks are carried in eleven distributing points throughout the United States

▽ SAFETY SWITCHES

THE ELECTRAGIST, October, 1926, Vol. 25, No. 12, $2.00 per year, 20 cents a copy. Published monthly at 100 Liberty Street, Utica, N. Y. Association of Electragists—International, 15 West 37th St., New York, N. Y. Entered as second class matter September 1, 1919, at the Post Office at Utica, N. Y., under the act of March 3, 1879.



They're "wire wise" in Houston

(1) Esperson Bldg., Cooke, contractor; (2) Second National Bank Bldg., Jacobe Bros.. contractors; (3) Medical Arts Bldg., Eugene Ashe, contractor; (4) Post Dispatch Bldg., Jacobe Bros., contractors; (5) Keystone Bldg., Eugene Ashe, contractor; (6) Sam Houston Hotel, Eugene Ashe, contractor; (7) City Auditorium, Jacobe Bros., contractors; (8) First National Bank Bldg., Eugene Ashe, contractor; (9) State National Bank Bldg., Jacobe Bros., contractors; (10) Southern Pacific Bldg., Barden, contractor.

The picture above shows how the city of Houston, Texas, looks to the aviator sailing serenely above it.

And it also shows how "U. S." Paracore Wire stands with the electrical fraternity of this thriving Southwestern city.

For each of the buildings numbered is wired exclusively with "U. S." Paracore (see list at left.)

Here is a striking example of the preference for "U. S." Paracore by contractors who know its superiority and the reason for it.

"U. S." Paracore's preeminence is due to its better insulation, due in turn to the position occupied by its makers (The United States Rubber Company) as the world's largest grower, manufacturer and distributor of rubber and its products.

The "wire wise" contractor in Houston or Honolulu takes no chances. He installs "U. S." Paracore.

United States Rubber Company
1790 Broadway, New York City
Branches in every industrial center.

"U.S." PARACORE WIRES & CABLES
REG. U.S. PAT. OFF.
Standards that Surpass

There can be no reasonable doubt that we need laws in this country of ours, but a great statesman once remarked that too many laws were almost as dangerous as no laws at all. There are two reasons why this should be true, and both of them are sound according to people who study human actions and ideas. Too many laws have a tendency to make us Dumb Doras who ask some other fellow to make rules for us and thus save us the trial of thinking for ourselves. It is also true that an excess of laws breeds contempt of authority unless there is an iron hand to make the folks like it, and hands of iron are not likely to get far in America. If a law is fair and right and sound the folks soon take it for their own and swallow it whole. If the law does not seem right folks will be dead sure to try ways of beating it. Of course there is the law that a drink must not be—

well, anyway, we have enough laws to keep us fairly busy, so why strain ourselves making a lot of new laws? The fellow who does rotten work is going to beat the new laws, and no law will help a competent contractor make more profit. Why not invoke the old law of real service to the customer, and leave ourselves free to give him the job of wiring that will deliver safety, permanence and efficiency at the lowest possible cost to him?

Electrical Porcelain Manufacturers' Association

304 Tacoma Building **Chicago, Ill.**

FRANKLIN POTTERY

(A CORPORATION)

LANSDALE, PENNA.

NEW PRICES!

45% off to Dealers

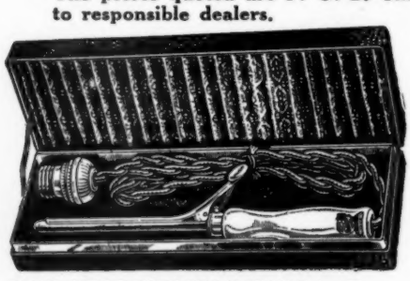
Never in electrical history have you been offered such terms or such salable merchandise. Revolutionary improvements have been made in the Hold-Heet line. Now, by buying direct, you get the newer appliances, the extra profit, quick deliveries and first look-in on still bigger things to come.

ORDER FROM THESE PAGES

Inspect Any Items At Our Risk

This page is your catalog. Order a sample of every number that appeals to you. You are privileged upon inspection to return ANY OR ALL OF THEM BY EXPRESS COLLECT, if for any reason they do not hand you a pleasant surprise. Here's your chance to make a Christmas cleanup and RIGHT NOW is the time to take it. Look at these items—these prices—and act fast for your pocketbook's sake. The prices quoted are F. O. B. Chicago, terms 5 per cent.—20 days to responsible dealers.

NO. 16 HEATER—solid 13½ in. copper bowl, mahogany bronze finish, cast base, separable plug at back, dimpled surface diffuses heat and gives rich appearance of bed of glowing coals—retails $6.85, **your cost $3.76.**



HOLD HEET CURLERS DELUXE in silk lined cases. All have separable silk R. C. tinsel cords in colors to match.

D-3 small rod, ivory or rosewood, retails $3.25, **your cost $1.79.**

D-5 large rod, ivory or rosewood, retails $3.50, **your cost $1.92.**

D-213 Hair Drying Comb with No. 3 Curler, ivory finish, in DeLuxe case, retails $6.00, **your cost $3.30.**

PERCOLATORS IN NICKLE FINISH
Highest Quality.

246—6-cup Colonial, retails $9.85, **your cost $5.42**
249—9-cup Colonial, retails $11.85, **your cost $6.52**
226—6-cup Grecian, retails $9.85, **your cost $5.42**
229—9-cup Grecian, retails $11.85, **your cost $6.52**

Leader Paneled Urn Set 9-cup: An outstanding value. Heavy metal. nickle finish throughout. Extra large gold lined Creamer and Sugar.
285S Four-piece set, retails $24.50, **your cost $13.48.**
No. 285 Urn only, retails $14.00, **your cost $7.70.**

No. 77 Reversible Toaster, large size, retails $3.95, **your cost $2.17**

No. 76 Solid Door Type, retails $3.50, **your cost $1.92**

R-88 Utility Pot, 3½ cups. Percolator, Tea Pot and Kettle. **Your cost $2.00**

R-85 9-cup Aluminum Percolator **Your cost $3.30**

No. 850 9-cup, nickle finish. **Your cost $4.13**

R-82 four-cup Aluminum Percolator **Your cost $1.70**

R-80 7½ cup Aluminum Percolator **Your cost $2.15**

RUSSELL ELECTRIC COMPANY

NEW APPLIANCES

BUY DIRECT!

NEW DESIGNS, BETTER MERCHANDISE, GUARANTEED 2 YEARS

EXAMINE THESE PROFIT OPPORTUNITIES FOR CHRISTMAS BUSINESS. ORDER NOW

NO. 14 WAFFLE IRON, DELUXE, artistic design, etched panels, octagonal handles, 8 inch cast aluminum grid, large expansion hinge. An outstanding value. Retails $12.00. **Your cost $6.60**

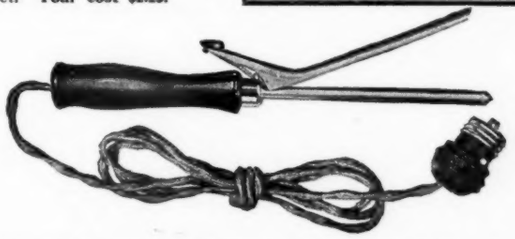
ALL HOLD-HEET URN SETS ARE HEAVY GAUGE, HIGHEST QUALITY NICKLE FINISH THROUGHOUT

No. 240S Colonial Urn Set, 9-cup, retails $36.00, **your cost**.....**$19.80**
No. 240 Colonial Urn only, 9-cup, retails $17.50, **your cost**..... **9.63**
No. 220S Grecian Urn Set, 9-cup, retails $36.00, **your cost**..... **19.80**
No. 220 Grecian Urn only, 9-cup, retails $17.50, **your cost**..... **9.63**

R-12 Heater—12½ in. bowl, copper finish, separable plug at back, mahogany finish, beautiful artistic appearance. The outstanding Heater value on the market. **Your cost $2.25.**

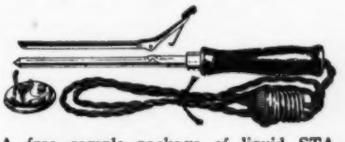
STARTLING DEVELOPMENTS
Are in store for the dealers who line up with Hold-Heet on this offer. Things are coming to make you more money than you have ever made before.
ASK ABOUT OUR FLASHING MOVING
WINDOW DISPLAY SIGNS

All Hold Heet Pads have three-heat nickle plated switch and double series thermostat.
No. D111 DeLuxe, white eiderdown in DeLuxe case as shown, 12x15 in. Retails $10.00 **Your cost $5.50.**
No. 1111 Standard gray eiderdown, 12x15 in. Retails $8.00. **Your cost $4.40.**
No. R18, 9x12 in. **Your cost $3.30.**



ALL HOLD HEET CURLERS have silk R. C. tinsel cord to match and are packed in embossed gray hinged display carton.
No. 31 Curler, ebony finish, small rod, retails $1.50, **your cost $ .83**
No. 36 Curler, ebony finish, large rod, retails $1.75, **your cost $ .96**
No. 3 Curler, small rod, specify Orchid, Delft Blue, Ivory or Rosewood finish, with connector plug, retails $2.50, **your cost $1.38**
No. 5 Curler, large rod, same colors as No. 3 above, retails $2.75, with separable plug in handle, **your cost $1.51.**

No. R-19 Electric Match
Your cost.....**$1.00**



A free sample package of liquid STA-COMB is supplied free with every Rex Curler.
Flapper, your cost.....**$ .47**
No. R-44 Ebonized handle, **your cost $ .55**
No. R-40 Combination Curler, Waver Rod and Marcel Iron, **your cost $ .70**
No. R-41 With silk R. C. tinsel cord, specify Orchid, Delft Blue or Ivory. **Your cost**.....**$ .70**

348 West Huron Street, - - Chicago, Illinois

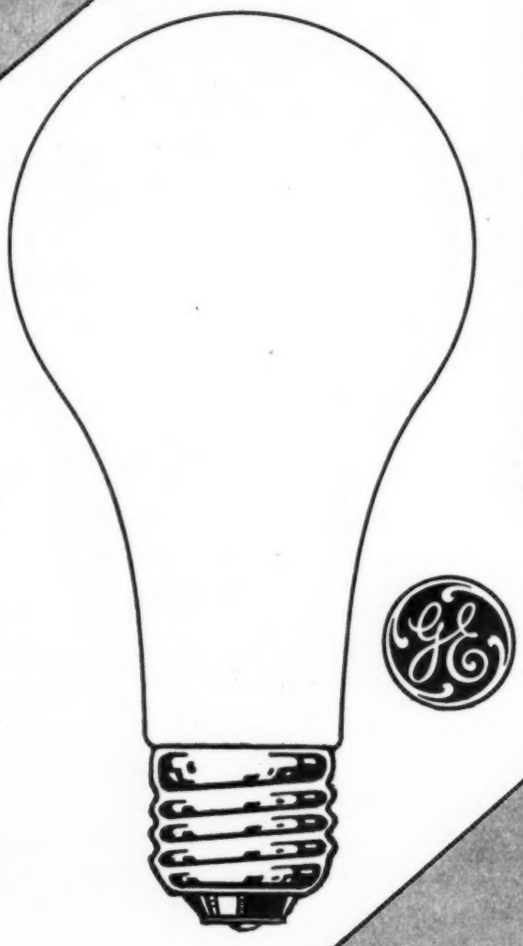
ECONOMY

In the days when a workman toiled long hours for meagre wages it was not economy but inefficiency.

Today every improvement in manufacturing processes means a saving to the public—the elimination of waste is the true economy.

The New Standard Line of Edison MAZDA Lamps was an economical achievement and the benefit has been passed on to the consumer. The new low price is the testimony.

EDISON MAZDA LAMPS



EDISON MAZDA LAMPS
A GENERAL ELECTRIC PRODUCT

TYPE N-3

"SOME fellers 'll grab any old switch t' pertect a high priced motor, 'thout knowin' a thing about it. It's like hirin' a stranger t' guard y'r valuables jus' 'cause he offers t' do it cheap.

"What's th' sense when all y' have t' do is look fer th' name Condit N-3 on th' box t' be sure y' get a *good* switch an' don't pay too much fer it."

*—SAFETY SAM.**

The Condit N-3 Oil Motor Starter has the same quality that electrical men associate with the name Condit on heavier switch gear. It comes manually operated or with push button control with or without undervoltage protection.

"It's jus' as easy t' say 'Gimme a Condit N-3' as it is t' say 'Gimme a switch,' and y' can take it from me that it's a blamed sight more sensible."

—S. S.

"*Get in touch with Condit*"

Condit Electrical Mfg. Corporation

Manufacturers of Electrical Protective Devices

Boston, Mass.

Northern Electric Company LIMITED

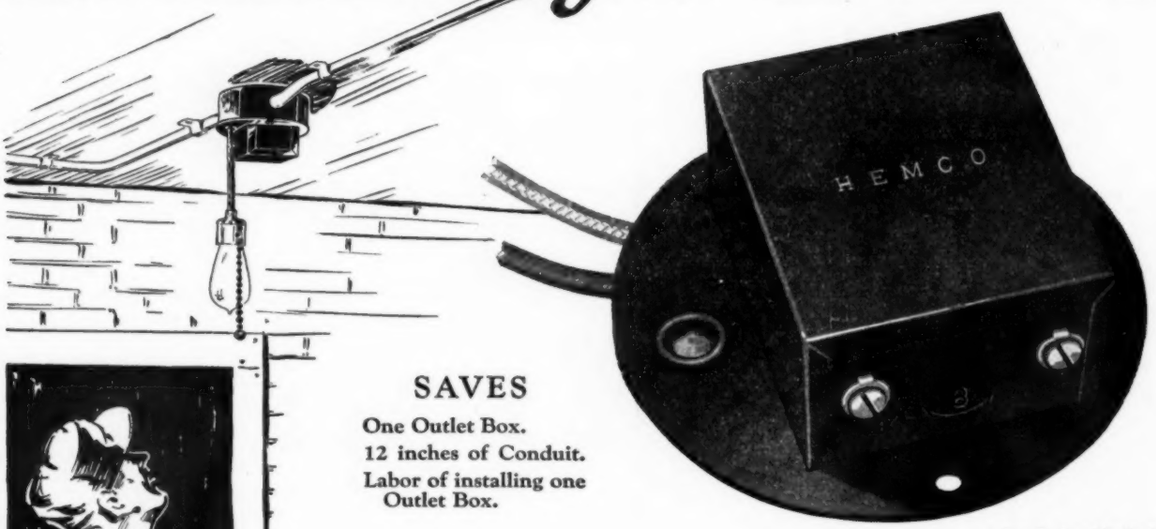
Sole Distributor for the Dominion of Canada.

271

SPECIFICATIONS: 3 or 4 pole. Standard sizes: 100 Amperes, 750 Volts or less. For motors up to 75 H. P., Phase Wound, and up to 25 H. P., Squirrel Cage. Approved by Underwriters.

CONDIT

A New Bell Transformer
that saves money for the contractor



SAVES

One Outlet Box.
12 inches of Conduit.
Labor of installing one Outlet Box.

Can be furnished with 4 inch round or square outlet box cover with knockout for drop cord or 3¼ inch covers without knockout.

A bell ringing transformer and a drop light—all from the same outlet box—if you use the new Steel Case Hemco Transformer mounted on Outlet Box Cover.

The transformer is mounted on a four-inch cover with generous, firmly anchored leads for quick connection to the line. *The cover has a bushed knockout to accommodate a drop cord.* It saves installing a separate box for the transformer or light. One outlet box serves for both. It saves material and most of all, it saves time.

The Hemco Bell Ringing Transformer in the genuine Bakelite case.

One type furnishes 6 volts. The three wire type has taps for 6, 12 and 18 volts and can be used for operating electric locks as well as ringing bells.

The transformer is the same dependable, low power-consuming type you have known for years. It pays to install transformers that give such lasting service, and the additional convenience of the new type means more profit to you.

Exactly the same as the transformer shown above except that the case is made of steel. Its small size makes it ideal for mounting in boxes.

Every contractor should know about them. Send for information and prices.

Fully approved by National Board of Fire Underwriters.

HEMCO Plugs

Solve the question of extra outlets not provided for in the permanent house wiring.

Five types that meet every need.

HEMCO Groun-Tite Fixture Hanger

Mounts fixtures and grounds them at the same time. Easily and cheaply installed. Write for full information.

HEMCO PRODUCTS

GEORGE RICHARDS & COMPANY INC.
557-WEST MONROE STREET-CHICAGO. ILLINOIS.

THE OLD-TIME CRAFTSMAN IN METAL ORNAMENTED HIS WORK WITH INCISED DESIGNS WHICH WERE FILLED WITH COLORED ENAMELS. THIS METHOD OF ORNAMENTATION WAS KNOWN AS NIELLO. THE 30 DESIGNS INCLUDED IN THIS NEW LINE ARE ORNAMENTED IN A SOMEWHAT SIMILAR MANNER AND THE OLD WORD —NIELLO—HAS THEREFORE BEEN DEEMED APPROPRIATE TO DESIGNATE THIS PARTICULAR GROUP OF BEARDSLEE DESIGNS. THESE FIXTURES ARE UNIQUE NOT ONLY IN DESIGN BUT BECAUSE OF THE FACT THAT THE TWO METALS USED PRINCIPALLY IN THEIR MANUFACTURE—COPPER AND IRON—ARE NOT PLATED BUT HAVE BEEN LEFT IN THEIR NATURAL STATE. THE FINISH WILL THEREFORE ENDURE AS LONG AS THE FIXTURES THEMSELVES, BECOMING MORE BEAUTIFUL UNDER THE SOFTENING TOUCH OF TIME.

NIELLO

A GROUP OF ARTISTIC FIXTURE DESIGNS IN COPPER AND IRON

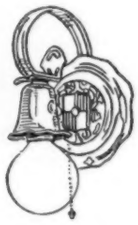
TRADE B MARK

ASIDE from the beauty of the designs this new line of Beardslee fixtures is notable for the fact that (with the exception of a few small brass parts) they are constructed throughout of copper and iron *in natural finishes*. No aluminum, lead, nor cheap metal alloys are used in making these fixtures, nor is any part of them plated.

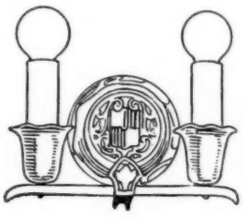
There is a medieval touch to these Niello designs that distinguishes them from all other lighting fixtures and makes it certain that the homes in which they are installed will be unique in their lighting equipment. The metallic lustre of the copper and the dull black of the iron form a combination that is indescribably charming and one that we venture to predict will set a new fashion in lighting fixtures.

The few dealers who have already secured samples report good sales. These new Niello fixtures have a strong popular appeal and prices are very moderate.

WRITE TODAY for prices and discounts and for catalog illustrating the 30 pieces included in this line.

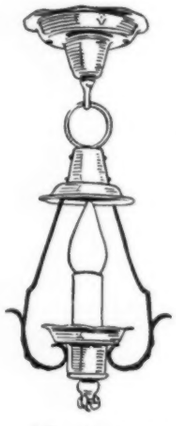


No N-17



No. N-1

BEARDSLEE
Chandelier Manufacturing Co.
231 South Jefferson Street
CHICAGO



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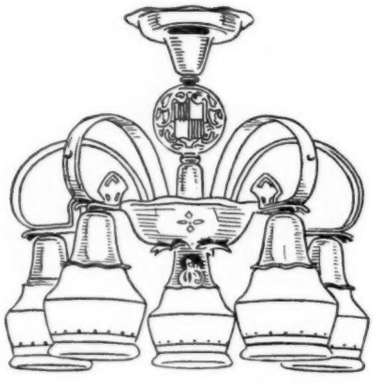

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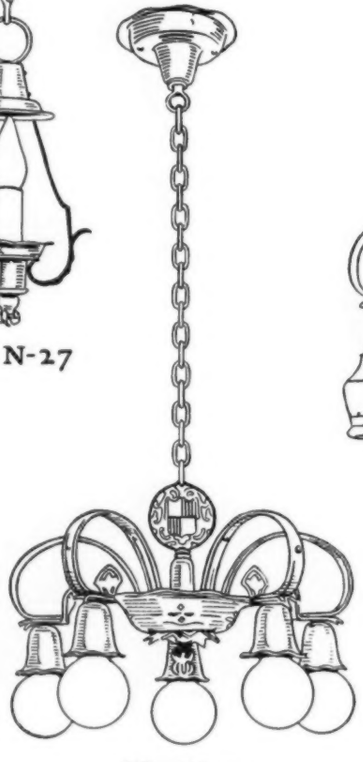
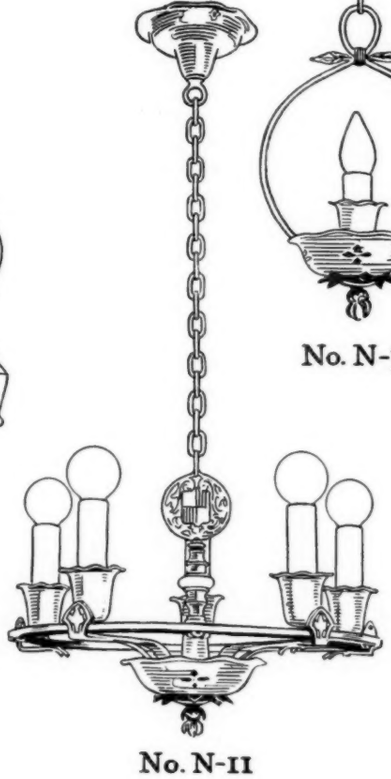
No. N-32



No. N-7

MEMBER ARTISTIC LIGHTING EQUIPMENT ASSOCIATION

Decorate with Artistic Lighting Equipment



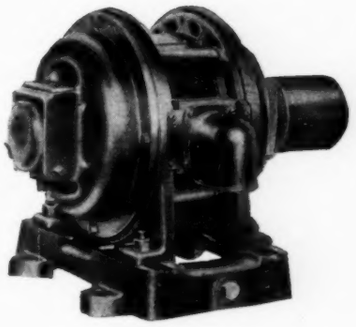
No. N-11

Why use a Samson to turn a grindstone?

A SAMSON furnishing the motive power for a grindstone: a giant motor hooked to a battery of small machines. No difference—both cause useless waste of power.

Engineers and contractors who realize that, are turning to individual drive as the answer to their power problems. And with sound reason. Individual drive delivers only the power that is needed, where it is needed. It makes each machine an independent production unit, permitting the most advantageous arrangement. Dependable power selectively available—that's what direct drive with motors from Graybar gives you.

A specialist from Graybar can show you how the efficiency and economy of individual drive will answer your power problems. Call him in.



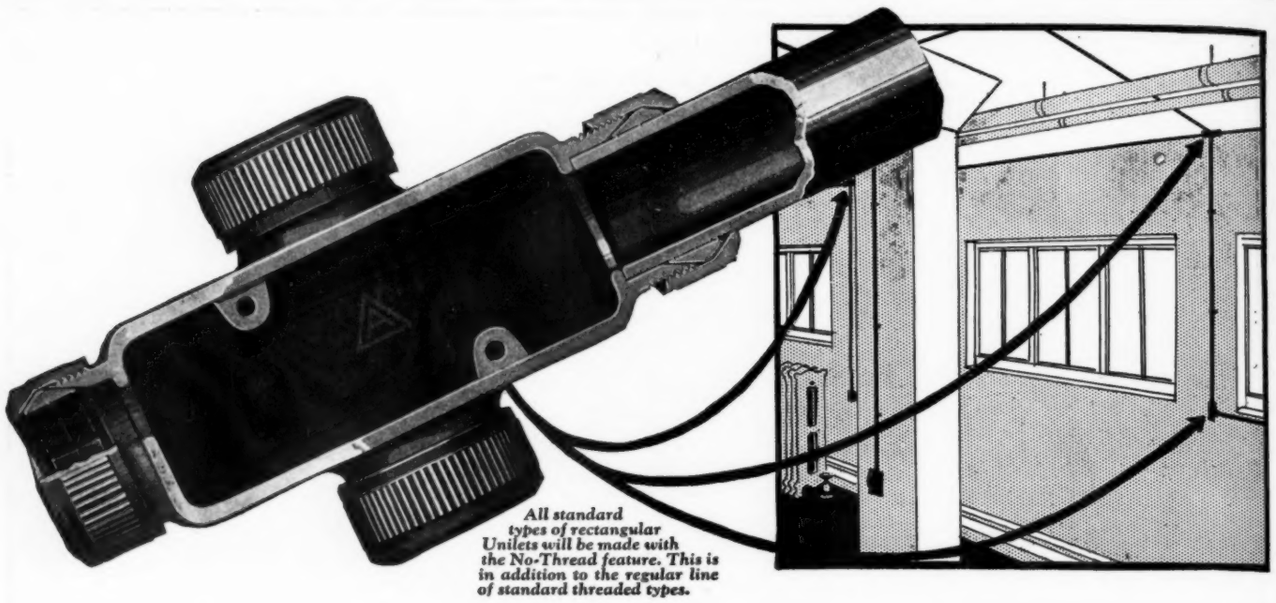
Offices in 58 Principal Cities
Executive Offices 100 East 42nd St., New York

GraybaR

Successor to Western Electric Supply Dept.

Electrical Supplies

THE GRAYBAR TAG UNDER WHICH 60,000 QUALITY ELECTRICAL SUPPLIES ARE SHIPPED



All standard types of rectangular Unilets will be made with the No-Thread feature. This is in addition to the regular line of standard threaded types.

Appleton announces *an improved line of* "No-Thread" Unilets

—to help you show a real profit on those tough jobs.

A time saver from the word go. No threads to cut, *no loose parts*, just utmost simplicity and efficiency.

Cut your conduit, slip it into a "No-Thread" Unilet, tighten the nut, and you're through. You'll have a mechanically secure joint, a perfect run ning ground and a stronger job in about one-fourth the time ordinarily necessary.

The beauty about these new Unilets is that the more complicated the job the more noticeable is the time saved.

Study closely the sectional view of this improved Unilet. Note its simple design. Note how the tapered steel ring is squeezed onto the conduit by the knurled nut—*from the outside.* There is no change in circumference of the threaded hub, hence no tendency to strip the threads of either nut or hub.

This same ring has on its inner surface three projecting beads that pierce through the conduit enamel, thus establishing a metal to metal contact and assuring a perfect running ground. Covers of the "No-Thread" Unilets are interchangeable with the standard line.

All in all you will find the improved "No-Thread" Unilets the most advanced fitting of this type since Appleton originated its "No-Thread" fittings in 1907.

Let us send you full information and specifications.

APPLETON ELECTRIC COMPANY

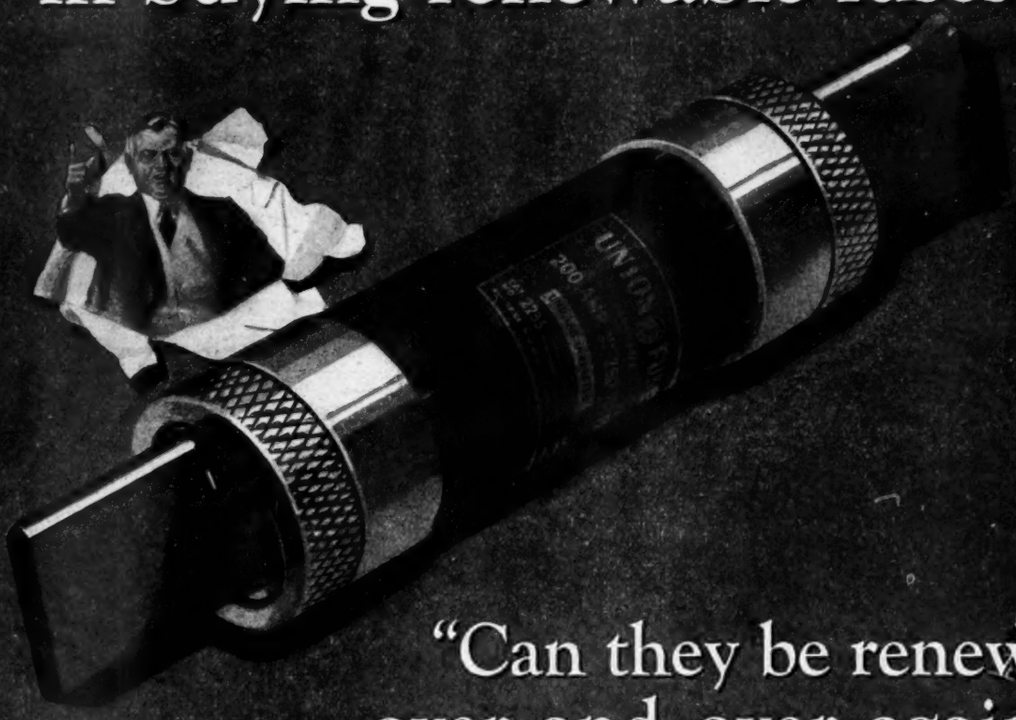
1704 Wellington Avenue · Chicago, U. S. A.

New York—150 Varick Street Los Angeles—340 Azusa Street

APPLETON UNILETS *and* CONDUIT FITTINGS

STANDARD FOR BETTER WIRING

"There is one point to remember in buying renewable fuses"



"Can they be renewed over and over again?"

You can count on this with "Unions."

They have an exceptionally heavy knife blade member that always keeps its alignment. The casing is heavy and substantial, with properly designed vents to relieve the smashing force of repeated "blowouts."

In every detail the additional strength and extra service of "Union Renewables" is evident to your most casual inspection.

Yes—you can depend upon using these fuses over and over again—to give you longer fuse service and reduced fuse expense. Because they are worth more they really cost less.

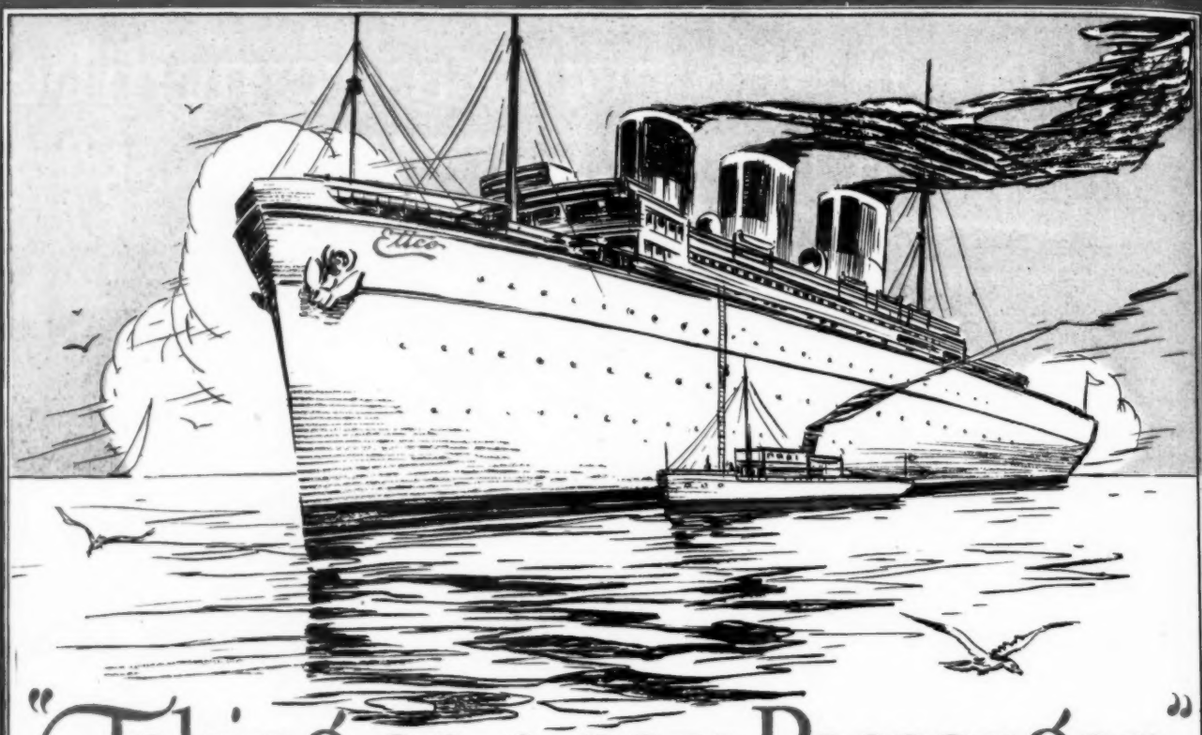
Note the few parts and substantial construction of these fuses.

"How to Select Fuses," the Union Chart, shows quickly the proper type fuse for all types of motors.

We shall be pleased to send one at your request.

CHICAGO FUSE MFG. CO.
INCORPORATED 1889
Manufacturers of Electrical Protecting Materials and Conduit Fittings
LAFLIN and 15th STS.
CHICAGO

UNION FUSES



"Taking on a new Passenger"

A new "passenger" has recently boarded the good ship **"ETTCO"**; it is **ETTCO-FLEX** Non-Metallic Sheathed Cable—worthy "traveling companion" for **ETTCO** Armored Cable, Flexible Steel Conduit and Loom. This new product makes an ideal addition and serves to emphasize anew Ettco's alertness—and ability to produce the kind of products that conditions may demand.

ETTCO Armored Cable has demonstrated its safety, strength, permanence and adaptability; it is tremendously popular, and justly so. And **ETTCO-Flex** will serve to supplement it—to "fill in" on those jobs for which it is best fitted.

This new product completes the cargo of the ship and provides an **approved** conductor for every need. Your jobber will signal this ship for you and extend the kind of cooperation that insures "clear sailing" into the port of profitable work.

Eastern Tube & Tool Co., Inc.

BROOKLYN, N. Y.

Ettco

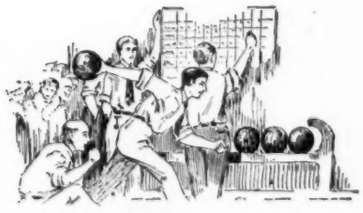
One of the new Moe-Bridges Fixtures in Cast Aluminum—the 200-K-5. The bracket to match is 201-K.2. Suitable with or without Parchment Shades [No. 1001].

Something New and Finer *in cast aluminum*

TRUE, Cast Aluminum Lighting Fixtures have been on the market for some time. But none so attractively designed, so beautifully finished, so perfectly made, as this new Moe–Bridges line!

Fixtures with a wealth of sales appeal, because of their graceful lines and handsome Antique Polychrome Finish, with its artistic blending of rich, warm colors. Especially fitting in the type of Amercan home that makes no attempt to conform to period.

Like all Moe–Bridges Lighting Equipment, the new Cast Aluminum Line carries a lifetime guarantee as to materials, workmanship and finish. And volume production has made possible some very advantageous prices. Write for complete details.



Promoting Co-operation

Throughout the Fall and Winter months, Moe-Bridges workers from all Departments engage in a series of bowling matches. The good fellowship developed "out of hours" is reflected in the added co-operation among our workers "on the job"—co-operation that means better workmanship and finer Lighting Equipment.

MOE–BRIDGES COMPANY, MILWAUKEE

NEW YORK	MINNEAPOLIS	LOS ANGELES
DETROIT	KANSAS CITY	SAN FRANCISCO
ST. LOUIS	DALLAS	ORLANDO

MOE-BRIDGES

Residential & Commercial Lighting Equipment.

FA Panelboards Qualify the Job and Assure Better Profits

THE job is trade marked, branded and sealed as being *a better job* the moment FA Panelboards are installed. That means satisfaction. Please the builder and you profit. For you really have but one visable sales point on the wiring job. That is the panelboard. All other work is concealed. Sell that and you sell the entire job. So why not make your selling point the best possible? That — of course — is FA Panelboards, "The Sign of a Better Job."

Oversized parts, standardized construction make FA the foremost in Panelboards. They fit accurately and true—even though installed months after the FA standardized steel cabinets.

Send for the most complete authority on Panelboards obtainable—the FA catalog. It is free. Estimates too, are gratis.

There is an FA District Office Near You

Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Chicago, Ill.
Cincinnati, Ohio
Dallas, Texas
Denver, Colo.
Detroit, Mich.
Kansas City, Mo.
Los Angeles, Cal.
Minneapolis, Minn.
New Orleans, La.
New York City, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Seattle, Wash.
San Francisco, Cal.
St. Louis, Mo.
Winnipeg, Canada
London, Ont., Canada

Frank Adam
ELECTRIC COMPANY
ST. LOUIS

The Owner Says—

"I do not specify products. But I do demand service! The contractor I want is the man who gives it. It is largely up to him what goes into the job. And he should be sure it is right, for that's what I'm paying for. After all it isn't the specifications that count with me—it's the way the job stands up!"

The Electragist

(*The National Electrical Contractor and The Electrical Contractor-Dealer*)

Official Journal of the
Association of Electragists—International

Vol. 25 OCTOBER, 1926 No. 12

An Outline of Electrical Merchandising

The Story of How a Failure Twenty Years Ago Has Been Converted into an Outstanding Success and a Sketch of the Methods that Brought About This Result

By G. FRED LAUBE

NO sooner had Mr. Laube finished his talk on successful merchandising at the 1926 A. E. I. convention at Cedar Point, Ohio, than the editor began to hear the question: "Are you going to publish this?" An address that proved so interesting to listeners that they wanted a chance to read it at their leisure and study it, deserved more space than could be allotted it in our last issue. Therefore we take pleasure in presenting in the following pages a detailed abstract of Mr. Laube's very frank analysis of his business methods. It merits the earnest attention of every man who sells electrical merchandise.—The Editor.

BEFORE telling the story of the electrical department store, I want to go back and begin at the very beginning, because I think folks always want to know: "Where does he come from? What has he done? How did he get his start?" So I am going to say something about the very beginning of our business, because there are those who, like myself, have had a hard time getting started and if I relate some of my experiences and my struggles they may be benefited. It was not a case of luck, but one of hard work and the meeting of some things that looked like misfortunes at the time they occurred.

If I took you back twenty years I would have to show you a little store, about thirty by forty feet, a one-story building, very moderate and in a location where rent was cheap. The organization at that time consisted of Mrs. Laube and one electrician, with a helper, a stock man and myself. I was the estimator, the purchasing agent, stock keeper, superintendent and treasurer. Luckily Mrs. Laube and myself were not on the payroll and we could stand ourselves off on Saturday, if necessary, even with the small payroll we did have.

The minute I started in business for myself I found that Rochester was pretty well organized among electrical contractors as it rightfully should have been. But I hadn't known that when I was working there for a big Buffalo concern, for the contractors in Rochester were afraid of my old boss because he had a way of coming in there and taking business away from them. But I had plenty of competition when I got on my own.

Finally I got the idea that I had to figure jobs lower than the rest of them. What were the consequences? On Christmas Day, about fourteen months after I started into business, I got to thinking the thing over. We had had some pretty tough times and things were going badly then, so I said to myself, "This is a hopeless fight." Then I went home and talked the matter over with Mrs. Laube and told her, "We'll just think about this over Christmas and perhaps I won't unlock that store on Monday."

For a while we thought about packing our grips and going back to Buffalo. Then we decided that if I were going to win out I couldn't do that, so that I had better stick right there until we got our money back at least. We weren't going to leave any Buffalo money in Rochester.

Nevertheless we decided to lock up the place. We had an indebtedness of only $1,400, but they were pressing us pretty close, so we turned the store over to them. That just about paid the debts and left us a clean slate.

Then we started work in the basement of our home. I would work until 2 or 3 o'clock in the morning, making my own panelboards and boxes, and then get up early the next morning and cart them out on the job. That went on for about three years and finally I got things coming my way.

I had a good friend who was in the

shoe business down on Main Street and about that time he proposed that I use his basement, rent free and including the use of his telephone. I took him up on that, moved in, got a little stock and then went to the Board of Underwriters in town. I told them I was going to stay in Rochester until I got my money back, that they might as well make up their mind to it and that I was going to do good work in the bargain. Then I went to two or three of my competitors and told them the same thing, adding that if they wanted to help me that would be fine, but if not I was going to stick anyway.

Meantime I had made up my mind that instead of quoting low figures I would give the best service and good quality in materials, and I put my heart and soul into the work, and pretty soon we had our money back. That was so encouraging that we decided to stay permanently. The next step was to open a store on a side street, renting it in connection with a tile concern. We put in a few fixtures because we realized that when we finished a wiring job the next thing to do would be to put in lighting fixtures.

After we put in those fixtures I found people were asking: "What kind of a washing machine have you?" I'd have to admit we didn't have any and they would continue: "Well, your wiring job is fine and your fixtures are all right, and we'd like to give you this business." And this led to our putting in washing machines.

Then I got to attending conventions, and if I have made a success in business it is because of the contact I have had with the wonderful men in the industry. I have found that the successful people that you meet with in the industry have a great effect on your business.

At one of the first meetings I attended in Cleveland I heard Bill Goodwin talk. He said that eventually the contractor would have to be a contractor-dealer and I took that story back home with me, thinking that some day I would have a real electrical store. So I studied the situation.

And here is a thought I want to leave with you. My first idea was to get a store on East Avenue, the Fifth Avenue of our city. But I studied Main Street, where it intersected with East Avenue, and I put one of my men, first in front of one store and then in front of another in that vicinity to keep tab on the number of passersby. In that way we discovered that the place for our store was on Main Street, where the masses of people were. We wanted to be where people were changing street cars, and where they would do the most window shopping.

We had been paying a rent of $900 in our old place and this jumped to $3,500 in the new. Nevertheless we took it, worked hard and were successful from the start. We had a store that was twenty feet wide by one hundred and fifty feet deep, close to the heart of Rochester.

Pretty soon we needed more room and got it by taking the three rooms at the rear of the adjoining store. Just a word here—don't grow too fast. Only as fast as seems natural to your business. It was three years after that that I took the store next door and added to our space. But when I took it it was needed, even though it brought our rent to $14,000 a year.

Later on I found myself ready for the electrical department store proposition and I knew I would need more funds than ever before. So I went down to the bank, explained things and before I got back to the store the bank had telephoned that they would let me have the cash I needed. So I say, see your bank first and do the rest afterwards and then you will be on the safe side.

Since then we have been running things along the lines explained below.

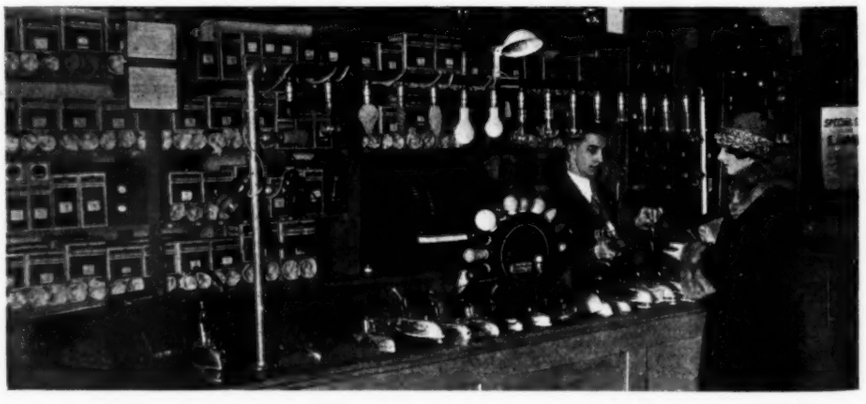
How the Store Is Departmentized and Laid Out

The store is called the Rochester Electrical Department Store and we keep a chart to show the set-up of our organization. There are really eight departments in the store, though we do not have a separate manager for each one.

In quoting the following figures I do it only to give a true idea of the extent of the business, because the words "large," "small" or "medium" don't of themselves indicate actual conditions. We do an annual business of about $400,000 per year. Of this the wiring department does about $150,000, the fixture department $75,000, the appliance department $50,000 and the retail store—the heart and soul of the department store—about $125,000. Incidentally appliances and fixtures are not classed with retail store sales; it handles only flatirons, toasters, floor and bridge lamps, fuses, cords, sockets, etc.

The sale of motors is one part of our business, though it is only carried on for the convenience of our customers. We don't try to sell large motor installations because we don't feel that is our field. Our motor department, which keeps two or three men busy, is carried on mainly to make repairs to small household motors, fans, vacuum cleaners and so on.

Now, about the layout of the store. The strange thing about it is that three years on Main Street gave us an entirely different store than we originally planned. The original one was intended to be forty by one hundred and fifty feet with small rooms all around and a mezzanine floor. But I learned afterward that wouldn't have been such a wonderful idea, because we had planned to use each room to display the fixtures and appliances for some particular room in the house, concentrating all kitchen merchandise in one room



The Lamp Rack Is at the Cash Register Where Customers Must Stop for Change

representing the kitchen, and so on.

That would have worked out badly. What we should have done—and did, through experience—was to put some of that kitchen stuff here and some there. In that way we had customers who only wanted kitchen appliances making tours of the whole store to get what they wanted. And the chances are that the customers, doing that, will see and buy goods they hadn't thought of before.

The idea of having things where people can see them—right out on tables in the aisles—has worked out excellently, even though it makes our store look something like a five-and-ten-cent store. In the illustration it can be seen that we have our lamps and most of our small stuff concentrated around the cash register, so that the people are always seeing them when they are waiting for change. A customer stands there, sees what she wants, though she doesn't happen to know the name of it, and she will say, "I want one of those things." If they weren't right under her nose she would forget about them and we would lose a lot of sales.

We find we have to give people a chance to handle this stuff. And when they do they become very much interested. Furthermore, cards on all the tables show the price of the items, which is another important thing.

Speaking of signs, we have them all around the store, about fifteen of them altogether. They read variously, "Visit our display rooms in the rear," "We repair all things electrical," "Let us do your wiring," and so on. You notice we don't say, "Let us estimate on your wiring." We don't want to estimate it —we want to do it.

A thing we are particular about is how the fixtures are hung. They are arranged so that we bring up the fixture, hang it on a hook, plug in the cord and it is done. There is no wiring to do—everything is fixed in less than a minute.

On every fixture we have a tag. A red tag means that we have that fixture in quantity, and on the back of the red tag there are figures running from 1 to 50. If we have six of a fixture in stock the number 6 is checked. The salesman always knows how many fixtures he has left of that kind. If we have six fixtures in stock and he sells two of them, he changes the 6 to 4, keeping up a perpetual inventory. If we have two fixtures that are much alike and the red tag on one of them shows it is out of stock, and the other is just as good, we try to sell the customer the one we have in stock.

A green tag indicates that the fixture to which it is attached is a sample and we have to order them from the factory. So if that customer is in a hurry the green tag keeps us out of trouble. We don't sell it to him, even though we can't persuade him to take another kind that is in stock. Good will is more valuable than an occasional lost order.

A yellow tag indicates a fixture is a slow mover and the salesman is allowed an extra ten percent commission for disposing of it.

The Advertising Policy and the Special Sale

In order to get the people to know we were in town we had to do some advertising and an explanation of our methods may be interesting. We got an advertising man because there were problems of publicity and window trim that we could not handle ourselves. And in getting one we were careful to pick a man who knew the advertising business in Rochester.

The man we hired had been acting in the same capacity for a furniture store, a department store and a luggage store, so I knew he was qualified. We employed him at $20 a week with the understanding that every Monday morning he would come over and we would chart the program for the week, determining what articles we would advertise, what window trim we would use and just how we could tie-in with some particular local situation. If it was February and there was a furniture sale on at one of the big furniture houses we would figure how we could use that to our benefit.

There would be a lot of women coming downtown to look at that furniture. So we would decide that the most logical thing to tie-in with a furniture sale would be a lamp sale. And we would plan that.

In every business, unless you know where and which way you are going, as a general thing you are going to go wrong. So when we get together on Monday morning, our advertising man, our store manager, our treasurer and myself, we have a written report of the week's business by the day, and we know how many sales have been made, what they total, what the average is, and the report gives us a lot of fine information.

We have the total of each clerk's sales, the credits, and by whom, whether we had certain advertising in on that day, or not, whether it rained or whether it was fair—because rain or fair weather has a bearing on your business, and advertising or no advertising also has its effect on your business.

So we sit down and analyze the business for the week and for the month. We say: "Last week we had a business of $2,000. Now we have got to beat that this week." We look back and see what we advertised last year in order to get a certain amount of business during a certain week. Perhaps we find that we had a special sale on bridge lamps and also brought out some low-priced article, such as a heater or some other thing. And in that way we know what we have to do in order to beat last year.

Checking Results

If our clerks are slower we know that. We can tell by volume of sale. If we have an advertisement in today, tonight our bookkeeper makes out a report of the sale and the business done —whether we sold one iron or one curler or three curlers. The advertised articles are reported so that we know just how many articles were sold through that advertisement.

Sometimes we put up for sale an article like the automatic Westinghouse iron, and we shove that into the window and quit advertising it, and in that way we find whether a good window trim gave us a nice sale on that iron. Then perhaps two or three months later we put an ad in the paper and don't put any irons in the window, and perhaps we find we don't sell as many irons.

It is a good plan, I believe, always to keep your name before the public in every legitimate way. We have two signs at the front of our store that are illuminated, our name is in large letters on the show windows and we have even obtained some advertising out of what seemed at first like an unfortunate circumstance. The landlord said that the building construction demanded a large post right at the center of our entrance. So on the front of the post we put a sign with our name and our slogan,

"Everything Electrical," and on the back of it are the words, "Thank you. Call again." And this is the last thing the customer sees when he leaves the store.

We always have two window trims. In one window we have our better goods as a rule and in the other our good, but less expensive, merchandise with the prices on it. If the prices are right and the material looks good the customers will come in.

Another thing about newspaper advertising is to have it ready well in advance. When it comes Christmas time or it gets cold enough for the electric heater to be brought out that is the time to cash in. The same thing is true when hot weather comes along. We get our advertising for our fan business, for instance, ready a month or two ahead of time. It is down there in the newspaper office, all set up. We know what we are going to put in our windows and so when a real hot day comes along we are all set to take advantage of it with the least trouble.

In regard to special sales I find we have to do three things—tie our advertisement and our window trim together, and tie our store arrangement in with both. The last time we enlarged our store I found we were going to be hidden for some time by the wooden canopy they had to erect in front of the building. I called that to the attention of the advertising man and his suggestion was that it gave me the very best excuse for putting on an alteration sale and advertising it extensively.

Who would think that we could make the "Dollar Day" a profitable proposition in the electrical field? Our Chamber of Commerce inaugurated the "Dollar Day" in Rochester, and we went along with the Dollar Day in the electrical line, though we didn't think it was practicable. We took certain articles, like a curler which we sell for $1.19, and sold that for a dollar. A boudoir lamp to sell for a dollar, with the shade for another dollar. And we also sell a guaranteed toaster for a dollar; and I maintain we do it legitimately. We do have some difficulty with them, as we do with every toaster, but the people get their money's worth.

On the last "Dollar Day" we did $900 worth of business with about 550 sales. It was well worth while, for it kept our clerks on their toes and those 550 people saw our whole display. They are not going to forget Laube's when they need other electrical merchandise.

So far, it would seem that our advertising has entirely to do with merchandising. It did, at first, but we began to feel that perhaps people didn't realize that we also did wiring. So now our advertisements are divided into five sections, one of which tells them about our wiring department.

Our advertising budget has been running about three percent. of our yearly sales volume. Most of it is placed through the newspapers and we have cut out the church programs entirely. In the last seven years we have spent on an average pretty close to $10,000 a year for publicity. Some people might think this rather extravagant. However, if we get enough money so that we can spend it, why worry? If we keep all our sweet potatoes and never plant them we will never have any more.

The Inexpensive Article Has Its Place

For a long time we never sold a cheap article. Yet in every paper I picked up I would see the advertisement of a hardware store, or a department store which would be selling curling irons at ninety-nine cents and bridge lamps at three dollars and all sorts of appliances and electrical goods that we were not stocking at all. I had always had the holy fear that it was not ethical even to try to sell a cheap electrical article.

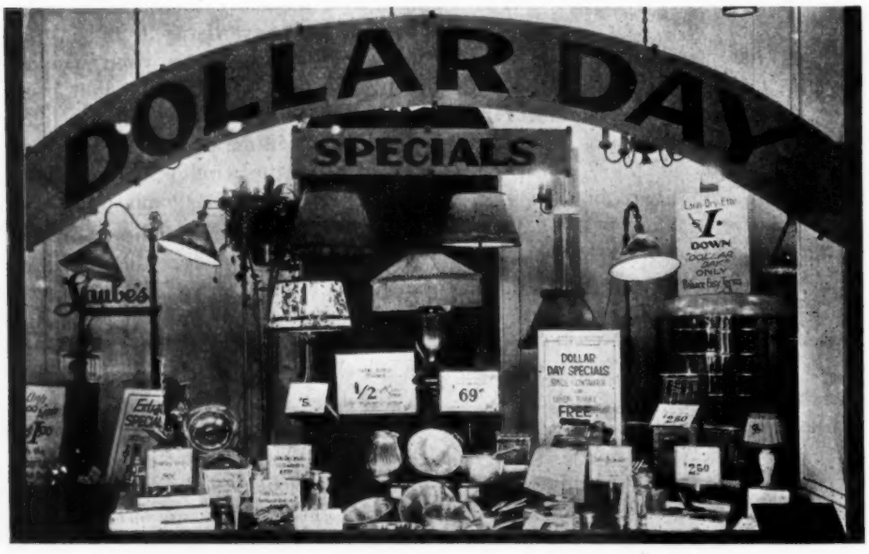
But, after thinking it over, I decided we would try out selling a bridge lamp at $3.95 and we started in with them. But I said first, "Everything we are going to sell in this store must have a guarantee." We were going to tell our customers: "Yes, we told you it was a first-class iron, and we know it is a good iron. If you haven't got satisfaction, here is another one."

No matter what we sell, there is a guarantee goes with it of first-class quality.

Later we tried the same thing with lamps. We had always sold an Association lamp, but when I realized how poor the lamps were that the department stores were selling at twenty-one cents, I changed my mind. If a department store sold lamps for twenty-one cents that were not right, I was going to sell the public a lamp that would be right, as far as voltage was concerned, and at the same price. And when they came in to buy, I would try to sell them our regular Association lamp. We started in and the thing worked out fine.

The result was that we sold more of our regular lamps, because more people got into the habit of coming to our store for lamps and that gave us an opportunity of telling them how much better the Association lamp was.

About the same thing happened with curling irons. We put up for sale a curling iron that we could sell for less money than our Westinghouse iron. My jobber called me and asked if I were trying to demoralize the electrical busi-



The Window Trim for Rochester's Dollar Day

ness. I asked him to be patient, to withhold his judgment for a month. At the end of that time he called me again and admitted that our sales of Westinghouse irons had been bigger during the period than ever before.

It was the same way with bridge lamps and other devices. By meeting the department store prices, we got the people to realize that they could get an electrical article from an electrical store for a small amount. We made some money on these goods and the mere fact that they brought people into the store helped along our regular lines tremendously. If you can get the customers in and can have your clerks trained so they will try to sell them other stuff, then the small profit on the cheap goods isn't all you will get out of it.

You may think from all this that we are developing a business where people buy cheap things. But that doesn't hold true. About a month ago we had the pleasure of selling a fixture job that fell just short of ten thousand dollars. We sell a lot of fine fixture jobs, but we have the cheaper jobs also.

Also we don't confine our special offerings to electrical goods. Hardware and drug and department stores use our lines as leaders so we are fighting fire with fire by using theirs. On our twentieth anniversary sale this year we sold aluminum ware at sixty-nine cents. We had sixty cases of it—we had to buy that much to get the price—and the first day of the sale we sold over six hundred pieces of it.

Another time we tried paint, but this didn't work out well. Fortunately we had an agreement with the manufacturer to sell on consignment and we didn't lose any money. Everything doesn't work, but if a thing seems worth trying we go ahead and try it.

Rochester's Electrical Department Store
Laube Charge Customers Will Find
Christmas Cash Unnecessary
And Will Not Be Billed Until February 1, 1926
More than a Month After Christmas
LAUBE stocks are larger than ever! LAUBE stocks are finer than ever—every article is now guaranteed by LAUBE! "Rochester's Electrical Department Store" gives you every advantage of quantity buying and selling and in this way a reputation gained in quality has spread itself to also cover the utmost economy.
IF YOU ARE NOT A CHARGE CUSTOMER
YOU can immediately become a LAUBE charge customer if you are numbered among that vast majority that pays its bills promptly, even though your total purchases may amount to very little. And you will not even be billed until more than a month after Christmas (February 1, 1926). Even then you have the customary ten days of "grace" in which to pay—over a month and a half from to-day.
YOU CAN obtain more for your Christmas gift money in electrical articles. Electrical articles will do more to keep you gratefully remembered throughout all the years of their faithful service. And never before was the use of electrical current so cheap, and therefore so universally used.
Electric Heater $4.35
Electric Waffle Iron $9.00
Electric Percolator $3.45
Electric Toaster $1.00
Half Price
Bridge, Floor and Boudoir Lamp Groups
Attracting the Sales Their Qualities and Savings Deserve
Spanish Brass Bridge Lamps
Complete With Shade
$8.75
Here is a Beautiful and Most Substantial Piece of "Furniture" As Well As a Practical Lamp
At That Most Remarkable Price
$2.25
Complete
Pioneers
in Outdoor Electrical Decorating
Including Such Notable Examples as Browncroft
COMPLETE WITH SHADE
Polychrome Bridge Lamps
$8.75
Boudoir Lamps $1.95
Electric Curling Iron 79c
Electric Flatiron $2.95
Desk Lamps $9.50
LAUBE ELECTRIC CORP.
338-40 Main St. East
STONE 104

An Example of the Laube Corporation's Newspaper Advertising

Public Always Responds to Fair Treatment

The most important factor in making our store pay has been our undeviating policy of giving the public a square deal, good service and good value. Personally I have always had the slogan that, "The customer is always right." In that connection I remember a case a good many years ago when letting go of a little profit meant a considerable sacrifice at the moment.

We were wiring a little house, belonging to a rather irascible old gentleman, and one of our electricians put his foot through the plaster of a ceiling. As soon as I heard about it I told the customer to have his decorator fix the ceiling and I would pay the bill. He did and when I sent my bill in for the wiring he deducted ninety-four dollars for the repair. I didn't argue, though it was one of those Saturdays when I needed every dollar—just accepted the check for the rest of the bill and tried to smile when I took it.

But when he wired his foundry and then, one by one, the additions to it, we got the jobs each time.

We never argue with customers in our store. They do rub it in occasionally and then go out and boast about it. They say: "That's a wonderful store to shop in. Why, I had this flatiron for two years and took it back and told them I had only had it one year and it was all wrong. And they made it good." But I would rather they would go out and tell that kind of a story than to go out and give us a bad name. We find that if we are liberal with our guarantee and kindly towards our customers we get big dividends in return.

We have had people call in and say, "I was in your store yesterday and bought some fixtures and it was a real pleasure to have your clerk wait on us." We tell them that's fine and that we will pass the word on to the clerk. Another customer calls up and says, "You have the worst place I was ever in. I don't see how you stay in business." And we admit that we sometimes wonder about it ourselves and ask what the trouble is this time. And then we get their tale of woe.

We ask our customers to let us know if they feel there is anything that isn't right with the place, because that is the way we can make it better. Always accept the kicks courageously and thank the kicker.

Now there are a lot of people who would never come into the store if we didn't do something to get them in. So we devised a scheme to get clubs from various churches and ladies' auxiliaries to come in and let us tell them how we had grown and how we tried to give them good service. We gave them an inducement by donating to their club treasury fifty cents for each woman they got to attend. And we decided on making the time Wednesday afternoon because by that time their washing and ironing was out of the way.

So the first party came in and browsed

around the store. We had a room specially set apart for them, all fixed up with a table and 3 waffle irons and 3 loving cup percolators. Our appliance manager, Mr. Barnes, told them he was mighty glad to have them there, and explained something about our organization and demonstrated some of the smaller appliances. The fixture man came in next and talked also.

Then we had a girl come out and start the waffle irons and make some coffee in the percolators and we handed the waffles and coffee around and gave the ladies a chance to do some of the talking, which is always good because it gives them a chance to crystallize in words what they have been thinking about electrical appliances. And once their thoughts are set on electrical appliances it isn't long before they are buying them. Then before they left we got them to sign their names in order that the club would get credit for the attendance of each lady. And there was a mailing list that couldn't be beaten.

One Wednesday night after such a gathering at our store, we had about thirty calls from different women, asking when the organizations they belonged to could come to the store for an afternoon. We have been running that proposition for two years. We shut down during July, August and December, but every other Wednesday and Friday has a meeting scheduled.

A very important thing in connection with the public is to have plenty of telephone service. We have a 4-trunk line switchboard in the store which costs us $125 a month, but it is as good money as we spend.

So far I have mentioned only our treatment of our customers, but we also have to consider their treatment of us in one particular. I mean their use of credits. We try to avoid taking chances on credits and our losses last year were one-twentieth of one percent. In ten years we have not been sued nor have we sued anyone. We haven't filed a lien in ten years. We are liberal with our terms, but people must live up to the terms we finally make.

There is nothing extraordinary in our relations with our patrons. They have been a large factor in our success, but they consist of nothing but good, honest service and the sale of material and appliances of good value.

Keeping Personnel Together

When we got the idea of calling our store an electrical department store I realized we would have to have a manager. So I thought the most sensible thing to do was to get a man who had had experience in a department store. I have always made it a point to observe people as I do business with them and I had noticed this man and had seen he had some unusual qualifications.

On investigation I found he had been very successful in the department store where he was employed, that he had built up a business from $70,000 a year to $400,000 a year in his department. So I made him an offer.

He accepted. His salary seemed big for my business, but it wasn't an extravagance because he knew his business. When a man knows how to do the job he is not a high-priced man; he is cheaper than a cheap man because you do not have all the aggravation that you would have with a cheap man, and you can use your own head for constructive work while he is doing the work that you employ him to do.

When it came to handling of finances we obtained the services of the assistant cashier of a bank where I did business. I had noticed that he was always on the job, that he was always courteous and pleasant and I determined that when the time came for us to have a financial man we were going to offer him the place.

The next thing is keeping your organization together after you once get it trained. We save our men if we possibly can. If a clerk doesn't fit in the stock room perhaps he will make a good man in some other department.

As for employee stock participation in the business, I believe in it. We never sell a penny's worth of stock outside the business and whatever stock is out I have given to the men who are associated with me—the treasurer, the store manager and the superintendent of construction. And I have set aside some stock for the other men. A dividend on that stock applies to the payment of the stock and when they have paid for half of it I give them the other half.

But the best way to keep an organization working smoothly is to keep it busy. Suggestion is a great factor there. No one ever sees our clerks hanging around visiting with each other. They keep busy. If there isn't anything else to do they can straighten up the shelves —make themselves think they are busy.

The Demonstration Room Ready for the Women Visitors

"A Wonderful Lot of Co-Workers"

If I have said anything that has merit in it, anything that will be of value to others, I shall feel that having spent twenty-five or thirty years in the electrical business is not without its compensations. And if any achievement has been apparent here and there it is just because I have had a wonderful lot of co-workers—men who have worked with me for years, men who have been loyal to our interests. Without such a loyal organization success could not be achieved.

An Analysis of Demand Factor Regulations

Examination of Rules in Several Places Governing Feeder Sizes Shows Three Controlling Factors: Occupancy, Size of Installation and Basis for Connected Load

By ARTHUR L. ABBOTT
Technical Director, Association of Electragists, Int.

DEMAND factor, or the ratio of the actual maximum load to the total connected load, has always been taken into account by engineers in designing feeder systems for large buildings. When the layout has been made by an engineer of standing the installation has usually been approved without question, but inspection departments have had their troubles with the contractor whose desire to save money led him to install feeders unjustifiably small in size.

At the present time the National Electrical Code contains no rule governing the size of wire for carrying a given connected load which may not all be in operation at the same time. What the Code does require is that a wire of a given size shall be protected by a fuse which must not exceed a certain maximum size.

Problem Stated

The difficulty at once is apparent. If, as is required in some places, the contractor must figure his feeders on the basis of so many amperes per branch circuit with no limitation on the number of branch circuits, it is to be expected that in order to save on feeder costs, the number of branch circuits will be cut down to rock bottom. On the other hand, unless a feeder is large enough to carry a reasonably high percentage of its connected load, it is a moral certainty that it will sooner or later be over-fused.

The feeling that has been growing for the past few years that it would be advantageous to the building owner, the engineer, the contractor and the inspector if standards for demand factors could be included in the Code, will undoubtedly be recognized in the next Code revision or shortly thereafter.

That the subject has been receiving considerable attention and that some progress has already been made in establishing load factors locally is evidenced by data which was recently secured by THE ELECTRAGIST as the result of a letter sent to Municipal and Underwriters' inspection departments in all of the larger cities.

First Effort in 1920

One of the first serious efforts to arrive at reasonable demand factors for general use was that of a committee of the Western Association of Electrical Inspectors (now Western Section, International Association of Electrical Inspectors). Victor H. Tousley was chairman of this committee. Their report, dated August 20, 1920, included as a tentative recommendation Table I given below with the demand factors in column A.

The "proposed" Electrical Safety Orders of the California Industrial Accident Commission, published in 1922, included a similar table, but with the demand factor values given in column B. This data, however, was not included in the rules finally adopted in 1925.

TABLE 1

CLASSIFICATION	Demand Factor in Per cent. Col. A	Col. B
Apartment Houses		
Number of apartments 1 to 5	100	100
6 to 10	95	90
11 to 15	90	80
16 to 25	85	70
26 to 35	80	60
Above 35	75	50
(Each apartment to be wired on a basis of 3/4 watt per square foot)		
Clothing manufacturers	100	90
Cranes	60	
Department Stores	75	90
Elevators—Passenger	70	
Foundries	75	75
Garages—Public	100	75
Hospitals	75	60
Hotels	75	75
Machine Shops—Jobbing	75	75
Manufacturers—General	75	75
Office Buildings	80	80
Packing Houses	80	80
Printing	80	80
Tanneries	75	75
Theatres	100	100

The electrical code of Chicago contains the section of the above table applying to apartment houses with the column A values, but increasing the required allowance per square foot to 1 watt.

Column B values are included in the wiring rules of the City of Los Angeles, but they may be applied only in computing the voltage drop, which may not exceed 3 percent. Minimum wattages per square foot are specified for a number of different classes of buildings. The city electrician is given authority to allow the use of demand factors in computing the size of feeders for carrying capacity, but this may only be done by special permission.

Washington Rules

The engineer department of the District of Columbia requires the use of 100 percent demand factor for lighting loads up to a connected load of 100 amp. on either a 2-wire or 3-wire system. For loads exceeding 100 amp. a demand factor of 75 percent may be used, except where it is evident that the total connected load will be in use at one time. Direct current power feeders are based on a 100 percent demand factor up to 100 amp. and 75 percent for all larger loads. For alternating current power the size of feeders is computed according to this rule: For full load running current of 100 amp. or less use twice the full load current of the largest motor plus the full load current of all other motors. For full load current of over 100 amp. use twice the full load current of the largest motor plus 75 percent of the full load current of all other motors.

The Bureau of Electrical Inspection of the City of Richmond, Va., issued a table on July 20, 1925, allowing the use of the following demand factors in determining feeder sizes. The connected load is considered to be 15 amperes per branch circuit. This of course

applies to wiring for light only.

TABLE 2—Richmond, Va.

Number of Circuits	Max. Connected Load—K. W.	Feeder Size	Demand Factor Percent
1— 4	6.6	10	83
5— 6	9.9	8	78
7—12	19.8	6	67
13—16	26.4	4	58
17—22	36.3	2	55
23—30	49.5	1	45
31—50 and over	82.5 and over		

A careful study of maximum demands in electric range installations has been made by F. A. Cambridge, city electrician of Winnipeg, Manitoba. This was reported at the 1925 Convention of the Western Association of Electrical Inspectors. Mr. Cambridge determined the maximum demands of 20 range installations in apartment houses by means of a recording ammeter which was kept in service for seven days in each case. The number of ranges per building varied from 4 to 34. Based on this experimental data the demand factors in Table 3 were arrived at and are now used in the City of Winnipeg for determining the size of services carrying range loads only.

TABLE 3

No. of Ranges On One Service	Demand Factors Percent	
	6 K. W. Ranges or smaller	7.5 K. W. Ranges
3	100	95
4	95	90
5	90	85
6	85	80
7	80	75
8	75	65
9	70	55
10	65	50
11	60	48
12	58	46
13	56	44
14	53	42
15	50	40
16	48	39
17	47	38
18	46	37
19	45	36
20	44	35
21	43	34
22	42	33
23	41	32
24	40	31
25 and over	40	30

A new ordinance which went into effect in the City of Portland, Ore., on June 26 of this year contains demand factor data which is far more comprehensive than any that has been found in any other city code. The tables applying to lighting loads are quite similar to Table 1, but differ in certain important respects, as will be noted if the two tables are compared. This ordinance also specifies minimum wattage requirements for the lighting of nearly all classes of buildings. The maximum load allowed on an ordinary branch circuit is 1,000 watts.

TABLE 4—Portland, Ore.

Classification	Demand Factor in Percent
Residences, Flats and Apartments— 1 to 5 circuits	100
6 to 10	90
11 to 15	80
16 to 20	70
21 to 30	60
Above 30	50
For installations of more than 10 circuits in	
Clothing Mfg. Plants	90
Department Stores	90
Foundries	75
Garages (except display rooms)	75
Hotels	75
Hospitals	70
Machine Shops	75
Manufacturing Plants (general)	75
Office Buildings	100
Packing Houses	80
Printing Establishments	80
Stores (general)	100
Restaurants	100
Tanneries	75
Schools (services only)	90
Warehouses	65
Range Loads—	
No. of Ranges	
1 to 2	100
3 to 4	95
5 to 6	90
7 to 8	80
9 to 11	70
12 to 15	60
16 to 20	55
Over 20	50

NOTE—Where the average range capacity exceeds 6 K. W. per range, demand factors 10% less than the above values may be used for more than 2 ranges.

The City of Winnipeg, Man., adopted a new ordinance, or "by-law" as it is termed in that country, on June 14, 1926, which contains a provision that Table C of Code rule No. 610 may be used to determine the size of service wires larger than No. 8 (3-wire) for mixed lighting and range loads in residences. This is equivalent to permitting the use of the following demand factors:

TABLE 5—Winnipeg, Man.

Connected Load in K. W.	Demand Factor in Percent
15.4	71
19.8	78
22.0	80
27.5	72
33.0	67

In apartment houses having more than six apartments the size of services and mains may be proportioned on the basis of a demand factor of 75 percent if there is only one branch circuit per apartment, or a demand factor of 50 percent if there are two or more branch circuits per apartment. The Winnipeg code includes very complete rules governing the minimum wattage per square foot.

It seems clear that if demand factors are to be standardized for general use it will be necessary to take into account three things:

1—The character of the occupancy of the building, i. e., whether the building be occupied as a store, office building, hotel, woodworking plant, printing plant, etc.

2—The size of the installation.

3—The basis on which the connected load is determined. (This applies to lighting installation only.)

1—*Occupancy*—It is generally recognized that the character of the occupancy has a decided effect on the demand factor. Installations may be classified somewhat as in the first table given here, though a great many more classifications will be required. For a large establishment the classifications will have to be extended to cover the various sections or departments. Thus taking a typical case of the lighting load in a large department store we might find the following main sub-divisions: Salesrooms, show windows, offices, shipping and receiving departments, stock rooms, tea room, employee's restaurant and recreation room. The demand factor for the entire installation should be determined by applying an individual demand factor to the connected load in each of the subdivisions.

2—*Size of Installation*—There is nothing unusual in finding all of the lamps connected to one branch lighting circuit burning at once. While less likely, it is still possible that two or perhaps three circuits may be found in an installation in full use at one time. As the number of circuits increases, and the load as well, the element of diversity of use enters in so that we find that instead of all circuits going at full connected load most circuits are only partially loaded and some even may not be in use at all. The more circuits that are added the more chance there is for diversity until a certain limit is reached

when there is no further increase in diversity.

This principle is well illustrated by the range data given in Table 3, which is based on actual facts.

3—*Basis for Connected Load*—The connected lighting load is generally determined before the lighting fixtures have been selected, usually by taking a fixed wattage per circuit. Sometimes the outlets on the plans show a wattage value, or the contractor himself has determined the outlet wattages, in which event the connected load is figured by taking the total of the outlet wattages. In either case, the combination of a parsimonious owner and a contractor who secures his business on a price basis only is apt to result in feeder sizes which are much too small to provide for adequate lighting even if the demand factor is taken as 100 percent. It is highly probable in such a case that additional outlets and branch circuits will be installed by the tenants until the feeders are overloaded. On the other hand, if the branch circuit wiring has been designed on a liberal basis with provision for future load the maximum demand may be less than 50 percent of the total branch circuit or outlet capacity.

Branch Circuit Requirements

It is apparent, therefore, that demand factors for lighting installations can mean nothing unless coupled up with definite minimum branch circuit requirements. Several cities—Chicago, Winnipeg, Portland, Ore., Los Angeles and San Francisco for example—now have such minimum requirements applying to certain classes of installations.

A good illustration of the application of these three principles is found in the Chicago demand factors for apartment houses (1) The type of occupancy is stated, i. e., the data applies to apartment houses only. (2) The size of the installation is taken into account as measured by the number of apartments in the building. (3) The city code contains definite requirements for the capacity of the branch circuit wiring in apartments.

Table No. 1 is deficient in that the installation sizes are not referred to except in the case of apartments, and the basis for circuit or outlet capacities is not stated.

The logical determination of demand factors can never be made a simple matter. For each classification as to occupancy and in some cases for each sub-division under the main classification we will have to be provided with a sliding scale of demand factors for installations of various sizes; for lighting systems these demand factors will be based upon definite standards as to branch circuit capacity, probably stated in the form of watts per square foot. Probably the same result can be accomplished in a more simple manner by computing a standard connected load based on the area of the space, according to standard watts-per-square-foot requirements, disregarding entirely the actual number of branch circuits and the number and capacity of the outlets.

Echoes from the Convention

ONE of the most interesting talks made at the 1926 convention of the A. E. I. at Cedar Point, Ohio, turned out to be one that wasn't on the program. It was that of William S. Boyd, secretary, Western Association of Electrical Inspectors, who is known to almost everyone in the electrical industry as "Bill" Boyd.

Called upon by President Fowler to say something on the subject of the proposed electragist standards for wiring specifications, Mr. Boyd came through with a talk that heartily supported any movement for higher standards of wiring and particularly this movement.

The interest of Gerard Swope, president of the General Electric Company, in the activities of the A. E I. was not confined only to the delivery of his address on the place of the electragist in the industry. On the very day of his return to his Schenectady office, he wired Mr. Fowler to call attention to an advertisement placed in national magazines by the Insurance Company of North America to urge safe wiring. As a result the convention passed a resolution commending the company on its constructive contribution to the education of the public.

A moment that bridged a gap of twenty-five years occurred when James R. Strong and Edward S. Keefer, of New York City, and Mr. and Mrs. Charles J. Sutter, of St. Louis, were called to the platform to receive gold badges in honor of their being the only ones at this convention who had attended the first convention in Buffalo in 1901.

The "Lady of Light," center of attraction to all the delegates without exception, proved a lady of luck to H. P. Blake, electrical contractor of Detroit. Curtis Lighting, Inc., awarded him first prize as the winner of the contest for painting the lifesize wax figure with the most beautiful combination of colored lighting.

A spirit of good fellowship and earnestness, of which any city could be proud, was displayed by the large delegation that came from Chicago. Their entrance to the banquet hall wearing "Chicago" placards on their backs, in the language of the theatre, "brought down the house."

The group from Michigan, which arrived under the generalship of N. J. Biddle, secretary of the Detroit Electragists, was probably the largest delegation to arrive as a unit. They came, over a hundred strong, and from their ranks were heard some of the most valuable ideas and suggestions brought up at the meeting.

The Association of Certified Electricians, the ACE of Northern Ohio, is less than a year old, but it is already a strong influence in the industry. It took an important part in this meeting by stage-managing the joint meeting of state associations which preceded the national meeting.

Canada was represented strongly, as it always has been at these conventions. And if the convention does not go to Winnipeg next year it will not be because the men from there failed to try for it.

L. L. Reading, of the Franklin Pottery, Inc., merited the appreciation of the association by acting as publicity director for the convention. As a result of his fine work stories of the convention were carried by the newspapers in Sandusky and other nearby cities.

Red Seal Progress

THE end of the summer finds the Red Seal plan in a position termed by The Society for Electrical Development as a most favorable one. The first year and a half of its operation, admittedly the hardest period in the promotion of such a campaign, is nearly over and the latest figures, though only partially complete, give the total of Red Seal homes, built or building, as well over 1,800. It is thought that complete reports would bring this number to 2,000.

The strides made by the plan within the last year may be judged by the fact that less than twelve months ago the leagues licensed to operate the plan locally numbered only eleven and the total of the certificates issued and applications pending was only slightly over two hundred. In the past year twenty-three additional leagues received Class A licenses, bringing the total up to thirty-four at the present writing. Within a very short time it is expected to add four more to this number, including Scranton, Pa., Jackson, Mich., Columbus, Ga., and Duluth, Minn. Applications for license have been filed by these communities and favorable action on their applications waits only on the approval of their Red Seal specifications.

During the past summer three new leagues were licensed, Savannah receiving its license on July 27, Elmira on August 18 and Chicago, the largest community yet to put the plan into operation, receiving its license on September 9.

Excellent results are expected from the plan in Chicago, for all branches of the industry there have gotten back of it strongly. The publicity campaign in the Midwest metropolis started off with a series of "teaser" ads, asking first what the Red Seal was and then promising a date for the appearance of the explanation. Large space advertisements were then used in all the principal newspapers of the city to explain the features of the Red Seal plan.

The conference of league secretaries at Camp Cooperation VI will also undoubtedly speed up the spread of the Red Seal, inasmuch as those in charge of local operation of the plan had one of their first opportunities to meet and exchange ideas.

Denver Educating Builders on Red Seal

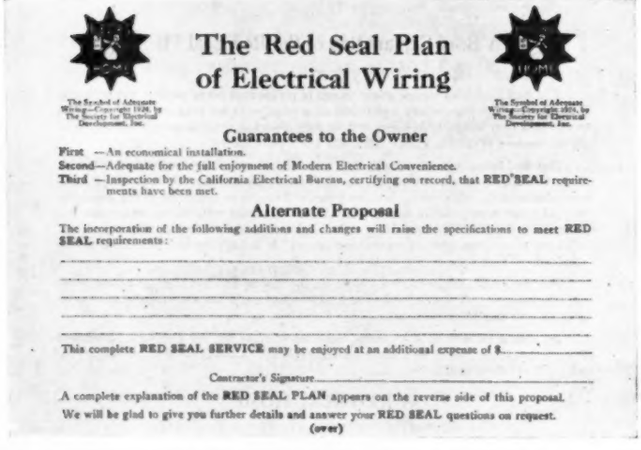
As a preliminary to the intensive promotion of the Red Seal plan in Denver, slated for next spring, the Electrical League of Colorado is now bending its energies to acquainting builders and contractors with the merits of this plan for adequate wiring.

The tentative program of the committee in charge consists of direct mail material mailed to those in the building industry and to residence permit holders as listed in the local newspapers. There will likewise be classes of instruction for electrical contractors and their journeymen so that they will be able to plan their own installations.

Rochester Publishes Names of Red Seal Owners

An excellent method of calling attention to the spread of the Red Seal locally has been adopted by the Electrical League of Rochester, N. Y. Each week the league supplies material for an electrical page in a local newspaper and whenever enough new Red Seal certificates have been awarded to make an imposing list the names and addresses of the owners of these homes are printed in the center of the page. It serves not only to call attention to the Red Seal, but also has a good psychological effect on Red Seal prospects, who are apt to feel that a wiring installation good enough to find its way into print is worth paying a little extra money for.

The California Red Seal Alternate Proposal



The Red Seal Plan of Electrical Wiring

The Symbol of Adequate Wiring—Copyright 1928, by The Society for Electrical Development, Inc.

The Symbol of Adequate Wiring—Copyright 1928, by The Society for Electrical Development, Inc.

Guarantees to the Owner

First —An economical installation.

Second—Adequate for the full enjoyment of Modern Electrical Convenience.

Third —Inspection by the California Electrical Bureau, certifying on record, that RED SEAL requirements have been met.

Alternate Proposal

The incorporation of the following additions and changes will raise the specifications to meet RED SEAL requirements:

.....

.....

.....

.....

.....

This complete RED SEAL SERVICE may be enjoyed at an additional expense of $.....

Contractor's Signature.....

A complete explanation of the RED SEAL PLAN appears on the reverse side of this proposal.

We will be glad to give you further details and answer your RED SEAL questions on request.

(over)

A Brief Explanation of the Red Seal Plan

The Red Seal Plan means many things to prospective home owners, but primarily it means freedom from worry and doubt as to whether or not they are going to be able to use their floor lamps, table lamps and various electrical appliances with comfort and convenience — WHERE THEY DESIRE TO USE THEM.

Red Seal home owners will not have an unsightly and dangerous web of extension cords weaving their way about the various rooms; nor will they be faced with the disagreeable prospect of re-wiring in a few years to bring their homes up to the standards that ALL homes are rapidly approaching. That is a point well worthy of careful consideration—the possibility of a desire to re-sell at a later date, at which time your home will have to compete with others that are newer. If it isn't modern according to the standards of that time, it will be difficult to sell.

For the small additional sum shown on the face of this bid, you can assure yourself of a home electrically convenient in which to live and a home electrically modern to offer for sale should occasion arise.

All this is assured by the careful inspections made by the California Electrical Bureau, and is certified to by a RED SEAL OWNER'S CERTIFICATE issued to you. All you need do is specify

"A RED SEAL HOME"

Above are shown the front and back of the Red Seal alternate proposal forms which have been issued to California contractors by The California Electrical Bureau. They are being used as supplements to all bids where the customer is asking for competitive bids and they permit the contractor to compete on any job while at the same time getting a Red Seal proposal before the prospect

The Industry Organizes for Co-operative Market Development

Five-Year Program to Make a Co-ordinated Whole of the National Resources of the Industry and Its Thousands of Contacts With the Public

A MILESTONE in cooperative electrical market development work was reached at Association Island, September 1-4, when representatives of electric leagues voted unanimously to accept the Five-Year Market Development Program of the League Council, based upon the coordination and the amalgamation of the electrical leagues and The Society for Electrical Development.

The purpose of the movement is to strengthen and increase the opportunity for local cooperative work, according to W. L. Goodwin, operating vice president of The Society for Electrical Development, who made it clear that if the local work was to be increased and that if the money was to come from national sources for it, it is essential that the financing of this work be a coordinated whole, and not a catch-as-catch-can undertaking, in which a few strong leagues received backing for a fine piece of work locally, but which essentially was at the best a spotty development of the market as a whole.

Conflict in Accomplishment

Basically, it was pointed out that the electrical industry is not alone competing within itself for business, but competing for public attention with all businesses. The consumer must decide whether to spend his dollar for an automobile, an electrical refrigerator, a washing machine, a Victrola, the wired home or a new coat of paint, or dozens of other appeals. The clash of competitive advertising for public attention broadly creates a mass of publicity for the particular commodity advertised, but it is evident that the proportion of the money which must necessarily be spent for competitive work may be spent constructively for cooperative education of the public in the electrical idea as distinct from the many other sales appeals that are being made.

It was evident to those who had the plan in mind that the electrical industry needed a calendar of events, so that conflict and waste in accomplishment in public education would be eliminated as much as possible and an orderly procedure established for forwarding the education of the public in the electrical idea. This calls for a plan that will not, on the one hand, limit the number of ideas which can be carried out during a period of time, but will save confusion between, let us say, an industrial lighting program, an electrical refrigeration program and a wiring program all going forward at the same time, supported by those nationally and locally who are fundamentally interested.

A Coordinated Plan

As a basis for orderly procedure, therefore, it is essential that a plan be set up by commodity groups, or product classes, so that the manufacturers, who are responsible for national development, will feel a primary interest not only in the general idea of public education electrically, to which they have given support in the past, but interested in much greater numbers in specialized programs for national and local action built around products.

It is apparent also that the local responsibility for market development lay with the central station, just as the national responsibility lay with the manufacturer. It was apparent, moreover, that the central station had much the same problem of coordinating the local work of a league that the manufacturer had in coordinating local work nationally.

All these basic principles and many more were considered in setting up the Five-Year Market Development Program, the machinery for which, after all, involves no new organization, but merely the coordinating of existing bodies. A Board of Governors of The Society for Electrical Development is set up having both national and local representation which, in effect, becomes a Plan Board of cooperative commercial development, to which any initiating body may bring ideas and plans to be worked out on a national basis with proper financial resources. The plan provides that leagues electing to adopt the program shall become chapters of The Society for Electrical Development. The plan further provides that even these chapters are complete in authority locally, that is to say, they may accept or reject responsibility for carrying out a national program, but it is assumed that they would accept the responsibility for carrying out a national program because of the funds to be received for putting this to work locally.

The Society for Electrical Development under this plan continues to function as a working organization for the industry, receiving its guidance as to programs from the various councils which are set up in the plan and providing the staff for carrying out the programs as set up by such councils or committees. There is nothing new in this organization since it is on this basis that the society is at present operating and the plan simply makes available for local work a more orderly and effective use of national effort.

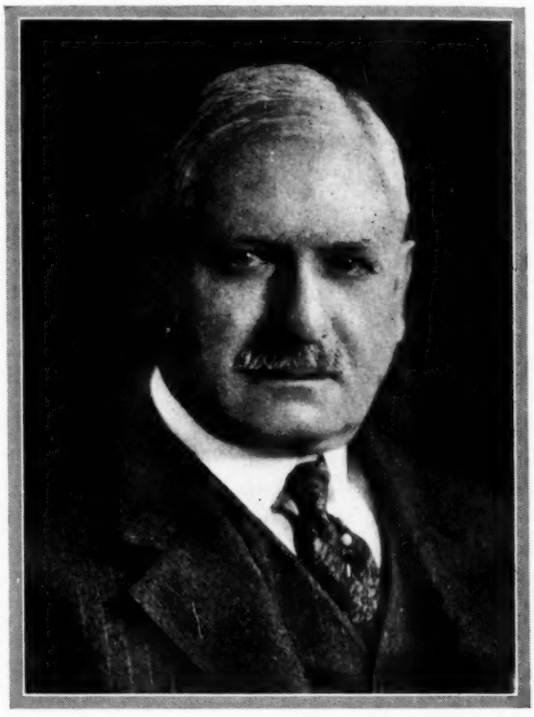
Objective of Industry

F. M. Feiker, operating vice president of the society, in discussing this program said: "The objective of the industry should be seen clearly as the buyer or final consumer, and that the machinery for public education of this buyer to the electrical idea would altogether fail if we lost sight of the fact that he was the common denominator both locally and nationally."

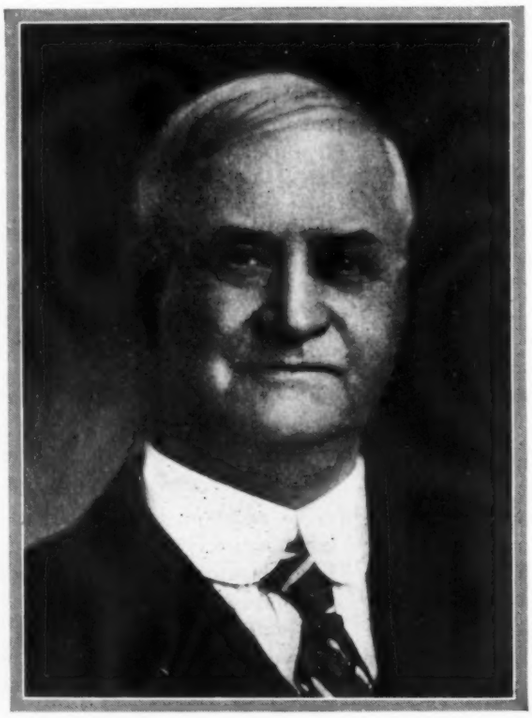
To accomplish this market development activity a financial program has been set up providing a national product development fund by manufacturers for national work, a cheaper product development fund by local interests for local work and an organization operating fund, collected from national and local subscriptions and prorated half to the national body and half to chapters.

J. C. Hatzel, New York

J. C. HATZEL holds that honor envied of electrical men—membership in the Edison Pioneers, for his first job was with that famous old organization, the Edison Electric Illuminating Company of New York. Mr. Hatzel was born in New York in 1860, was educated in the public schools and the College, City of New York, and in 1881 obtained the position with the Edison company. Later he was transferred to the Edison Company for Isolated Lighting and in 1883 was appointed superintendent of construction for the Southern district, with headquarters in Baltimore. A year later found him in the electrical construction and contracting business, installing lighting plants and electric railways, but four years after this he was again with the parent Edison company as president of the Western Edison Company, covering Colorado, Utah and New Mexico. Another year and he had returned to New York to form the partnership of Hatzel & Buehler, in company with Joseph Buehler. The firm has continued in the electrical construction business ever since, though Mr. Buehler retired from the partnership in 1911. Mr. Hatzel continued under the firm name, associating himself in 1917 with Allan Coggeshall, Harry J. Kurrus and Charles Metzger and incorporating the company. He is a member of many electrical organizations besides the A. E. I., including the Electrical Contractors' Association of New York City, New York State Electrical Contractors' and Dealers' Association, Electrical Board of Trade, American Institute of Electrical Engineers, New York Electrical Society, Illuminating Engineering Society, American Electro Chemical Society and the Edison Pioneers. The other organizations of which he is a member include the New York Building Trades Employers' Association and the Chamber of Commerce of the State of New York.



Electragists You Should Know



G. M. Jones, Minneapolis

THE entrance of G. M. Jones into the electrical business took place not so very long after that of Thomas A. Edison himself. It was in 1883 that he made his first acquaintance with volts, amperes and watts; how long ago that was in the electrical industry may be judged by the fact that at the beginning of that year, the New York Edison Company, then called the Edison Electric Illuminating Company of New York, had a total of only 231 customers and the number of lamps connected to the system was still under 6,000. Thus Mr. Jones can trace the development of his business career on an exact parallel with the development of the industry to which he has given forty years of sincere effort. He had been born twenty-one years earlier in Jay, N. Y., not so very far from the scene of electricity's first triumphs but when the time came for him to tie-in with the infant industry he had been living in Minneapolis for a number of years. His first job, like those of many who had been attracted by the new science of electricity, consisted at the beginning mainly of putting in bells and annunciator systems, along with such accessories as speaking tubes. In his letter giving the details of his career, he did not state the name of his first employer, but it was not very long before he was in business for himself, laying the foundations of the present Minneapolis Electric & Construction Company. The signaling system and bell work continued and gradually there grew up the foundations of the wiring construction business, Mr. Jones' company taking up each new development as it came, adding it to the rapidly-growing fund of experience and looking for still further electrical worlds to conquer. Later the company branched into the manufacturing end for the building of certain types of wire-measuring machines.

Chats on the National Electrical Code

A Monthly Discussion of Wiring Practice and Questions of Interpretation, Presented with a View Toward Encouraging a Better Understanding of the Industry's Most Important Set of Rules

By J. C. FORSYTH
Supervising Engineer, Bureau of Electricity, N. Y. Board of Fire Underwriters

Carrying Capacities of Conductors

It should be well known that the "Code" does not take into account voltage and current losses in tables giving the allowable carrying capacity of conductors. This is frequently overlooked and the "Code" is often condemned because satisfactory results are not obtained when an equipment is installed according to the rules and is found to be inadequate. Prior to and including the 1911 issue of the National Electrical Code a fine print note was inserted indicating that the question of "drop" was not taken into consideration. This statement has not appeared since that time and some have, without giving the matter proper thought, considered that the size of wires was sufficient for the amount of current indicated for any length of conductor both in feeders and branch circuits. This matter is particularly important at this time due to the fact that committees are at present considering the question of diversity factor for both lighting and power loads. In the installation of feeders where the major part of the load is a considerable distance from the source of supply it will be found economical to provide conductors larger than specified in the rules in order to overcome the average drop on the line. The loss in current due to this line resistance will often be more expensive to the owner than the increased cost of larger wires.

Keyless Sockets in Bath Rooms

Several cases have been reported recently of fatal shocks having occurred to persons attempting to operate a pull chain socket in a bath room while in contact with some of the plumbing work. Contact with 110 volts A. C. or even lower is sometimes fatal if the person is kept in circuit for any length of time and in such a position as to be unable to free himself. On old equipments, especially where insulating joints are used, it is frequently found that the pull chain or key sockets have not been polarized and there is, therefore, a probability that the socket shell and chain may be alive and at a difference of potential of 110 volts to ground. It would appear that the only practical way to eliminate this hazard is to require the lamp socket and receptacle to be placed out of reach and operated by a wall switch. In some cases this might add a few cents to the cost of the installation, but it would certainly seem to be well worth while in view of the additional protection which would be afforded.

Investigation of Electrical Fires

There is perhaps no more definite and clear method of reaching conclusions regarding any matter than by experience and through investigation of the causes which produce certain results. If electrical fires are being caused repeatedly from the same cause then there must be something radically wrong and a suitable remedy should be applied. If for instance fixture wiring and fixture installation is so poorly done as to result in calling out the Fire Department every few days it would be well to give attention to the character of insulation on fixture wires, the method of constructing fixtures and the manner in which they are installed. It has been found that the most frequent cause of fixture fires is due to improper joints and inadequate protection of these joints in fixture canopies. More attention should be paid by the fixture installers to this part of the work, as the number of fires from this cause are entirely too numerous.

Point of Attachment for Ground Wires

Rule 904C requires that the attachment of the grounding conductor to the metal raceway shall be as near as practical to the point where the conductors receive their supply. This rule is frequently misunderstood as the reason for grounding the metal raceway at the beginning of the circuit rather than at the far terminal is not given. It would perhaps make very little difference if metal raceways were grounded at the final point of termination provided each raceway was connected to ground from that point. Where an installation consisting of numerous raceways is grounded at the main point of current supply it will be readily seen that if a breakdown should occur at any point the current would be carried off in the most direct manner regardless as to which raceway was affected. This is particularly important in the case of armored cables due to the high resistance of the cable armor. It is for somewhat the same reason that the service conduit is required to have a separate ground conductor and not depend on the house conduit ground. This is because the service conductors are not protected by fuses and, therefore, the supply of current from this source is limited only by the size of the conductor in the conduit and the character of contact that may be made between the service wire and the conduit. Many fires have occurred from break down of service cables because the ground wire of the raceway system in the building was depended on also to ground the service conduit. The equipment ground while sufficient for the purpose for which it was installed was not adequate to take care of the volume of current set loose by the break down in the service conductors.

Feeder and Riser Sizes for Lighting Loads

Should the "Code" specify feeder and riser sizes for a given load or submit any general formula by which these sizes can be calculated? This is a vexing problem and one that has been

given much consideration. There are several "methods of approach," none of which, however, seem to be sufficiently comprehensive to serve as a general basis. Some of these methods are as follows:

A. *Require capacity for total connected load.* This would seem to be a very simple and direct method, but is not satisfactory in some classes of buildings where numerous outlets are installed for heating and appliance use. In short, how is one going to determine what the full load is going to be and should one make any provision for future additions?

B. *Require capacity sufficient to supply a minimum number of amperes per circuit.* This method would be fairly satisfactory until the contractor began to crowd his circuits to the limit in order to reduce his feeder sizes.

C. *Require capacity to supply a given wattage per square foot of floor surface or cubical content of rooms to which a feeder is carried.* This method is being strongly urged by some who have given this subject considerable study. It seems to be based on the idea that if an owner does not desire all the lighting prescribed in the Rule he is in some way "deficient" and should be forced to provide for it whether he wants it or not.

D. *Require capacity as may be determined by any of the foregoing methods and allow a diversity factor according to character of building or occupancy.* The weakness of this method consists in the number and variety of tables necessary to cover the field and the difficulty in securing agreement as to a satisfactory formula.

E. *Require nothing definite as to feeder or riser sizes, but leave the matter entirely open.* This is what the present Code does. So long as the feeders are protected by proper fuses they may be of any size from No. 14 up regardless of the connected load. This condition has long been regarded as a "weakness" in the Code, but what can be substituted for it that will produce more satisfactory results? It is hoped that the committee now working on this subject will bring to us some good solution.

Conduits, Armored Cables and Steam Pipes

In attempting to settle a dispute recently a special inspection was made of a newly-erected apartment house. It was an eighty-family building and therefore of sufficient size and value to warrant proper attention being given to the principal features of the electric equipment. All meters were located in the basement, thus necessitating a separate riser to each apartment. What was my surprise to find that in nearly every case the armored cable risers were bunched together and carried up the same shaft with the steam and hot water pipes and in direct contact with them. The shaft was barely large enough to contain all the cables and pipes and no attempt had been made to keep them apart. The contractor said it was the builder's fault; the builder said it was the architect's fault and I suppose the architect would say it was the owner's fault. But no matter whose fault it may have been it certainly was bad engineering. If allowed to remain the heating and condensation of moisture on the cable would hasten corrosion to such an extent that the insulation would weaken and break down many years sooner than it would under proper conditions.

Use of Electricity in Rooms Containing Volatile Materials

It is desired to call attention to Article 32 of the National Electrical Code, which is headed: "Extra Hazardous Locations." The requirements under this article along with some others in the Code which are of a special nature should be studied by the contractors in order that mistakes may be avoided when electrical equipments are to be installed in such locations. Processes of manufacturers when painting, enameling and similar finishing methods are performed by spraying, dipping, etc., are becoming quite common. In most cases the material employed is of a highly volatile and combustible nature and under operating conditions requires only a slight spark to cause an explosion and dangerous fire. The following definition of what constitutes a volatile material is given:

"Any liquid mixture, substance or compound which will emit an inflammable vapor at a temperature below 100 degrees Fahrenheit when tested in a Tagliabue open cup tester."

To comply with special requirements and avoid complications with rating organizations the following rules should be observed:

Enclosures surrounding these processes should be of fireproof construction and vented to the outer air.

Only electric incandescent lighting is permitted in such rooms.

All wiring shall be installed in rigid conduit.

All fuses or protective devices shall be located outside of room. Control switches if of the vapor-proof type may be used inside of room.

All lights to be surrounded by vapor-proof globes and approved wire guards.

If electric heaters are used to warm spray liquid they shall be especially approved.

Where exhaust fans are motor driven the motors shall be located outside of spray hoods and ventilating ducts.

If in spraying room all motors shall be of the totally enclosed type.

Vapor-proof control switches may be located inside of room. Protective devices or fuses shall be located outside of room.

All motor driven fans or blowers must be approved before being placed in service.

What may be termed "location" hazards are separated by the Code into three divisions:

1—The ordinary building where the rules apply generally.

2—Where inflammable dust is present in sufficient quantity to cause an explosion as treated under Rule 1003 for motors, Rule 1404 H for sockets, Rule 1202 A for switches, and 805 H for cutouts and fuses.

3—In extra hazardous locations as described in Article 32.

Record Artificial Voltage in California

The highest voltage yet obtained by man was demonstrated in the new laboratory of Stanford University, California, on Friday, September 17, before an assemblage of eminent men of science, educators, and the press. A ribbon of living flame, more than 20 feet long, leaped between two points high in the air above six giant transformers, marking the highest voltage yet attained at commercial frequency—2,100,000 volts.

Joker Clauses In Electrical Construction Contracts

Enumerating Some Indefinite Clauses Which Are Found in Many Electrical Contracts and Which Make Contracting a Gambler's Pastime

By WALTER CAVANNA

EVERY electrical contractor has during the course of his experience come in contact with so called "Joker Clauses" in the specifications of certain architects and engineers. These have been very costly to him in the performance of his contract as they imply one thing and may under another interpretation mean something diametrically opposite. Furthermore, certain clauses in these specifications are obviously unfair to the electrical contractor and show that the architect is biased towards the owner, and is not acting as an impartial judge with fairness towards both the owner and the contractor, in accordance with the ethics of his profession.

In the following, we have gathered together a few of these clauses taken at random from different specifications of certain architects. This list may be readily extended, and every electrical contractor, of wide experience, could no doubt add as many more to this list, which have cost him hundreds of dollars before final acceptance of his work.

General

"The plans and these specifications are to be taken together and anything shown on the plans and not mentioned in the specifications, or mentioned in the specifications and not shown on the plans is to be considered as both shown and specified. The contractor shall furnish and install same as if both shown and specified."

This clause is in general use by many architects and is intended to cover certain omissions by the architect and to be used as a club to compel the contractor to furnish anything not clearly shown or specified and which is obviously an error on the part of the architect.

Many times the contractor will come across clauses in the specifications which have no bearing on the particular work under contract and which have been culled from some other specifications, and do not belong in this specification. On the other hand, he frequently finds work shown on the plans with no mention of it in the specifications which leaves him completely at sea as to whether such work is required under his contract or not.

Scope

"It is the intent and purpose of these specifications to provide for the furnishing and installation of a complete system of wiring for electric lighting, power, telephones and clocks. The entire work to be done in accordance with these specifications and the accompanying plans and as directed by the architect and also to his complete satisfaction."

This clause can be interpreted by an unfair architect to compel a contractor to include anything in the contract missing or forgotten from the plans and specifications that in the judgment of the architect may be required to complete the work.

It can be readily noted that work omitted from plans and specifications should come under the category of "Extra Work," and should be paid for accordingly to standard practice in that locality. It is unfair to expect any contractor to include in his estimate work overlooked by the architect and be responsible for the architects' omissions.

Drawings

"Submit detailed drawings to scale showing complete layout of all conduits, wires, cables, sizes of same together with drawings covering all changes that may be ordered by the architect during progress of the work. Riser diagram showing sizes of main feeders for light together with all light and power panelboards and their number of circuits to be also submitted for approval before any work is started. Capacity of all motors and the size of wire and conduit will be indicated thereon, making same complete in every respect."

It can be readily perceived by careful perusal of this clause that the contractor, having such a clause in his contract would be expected to lay out and design the entire work and thereby perform the duties of engineer as well as electrical contractor. It has come to the attention of the writer recently, where such a clause was in the contract, that the contractor was expected to furnish the architect with a complete layout starting only with the outlets located on the plans.

The contractor is put to considerable engineering expense which he has to include in his estimate for the work, thereby making the owner pay for the work twice as the architect receives his commission for the layout which he does not perform, but passes the work on to the contractor.

This practice is unfair to the contractor and also to the owner. It is unfair to the contractor for it makes him perform the services of an engineer. Such work should be done in the architect's or engineer's office which is better equipped to perform it than the contractor's office. It is furthermore unfair to the owner as he is paying twice for the same piece of work.

Temporary Lighting

"This contractor shall provide and install all temporary light and power wiring, that may be found necessary in the progress of the work. This contractor shall supply and maintain all such lights and power and pay all charges for current and temporary inspection fees. This contractor shall furnish and install all such lights and power wherever required when ordered to do so by the general contractor or any of sub-contractors on the work in

order to aid in the prompt execution of the work and the final completion of the contract."

Any contractor with such a clause in his contract could expect that the above might cost him anything from five hundred to five thousand dollars, according to the extent of his contract. Work of this nature should only be performed under time and material conditions plus a fixed sum for overhead and profit.

The Architect

"In case of any doubt or difference of opinion as to the true intent and meaning of the drawings and specifications, or as to any questions arising out of them, the decision of the architect shall be final and binding on all parties to this contract."

If the architect was an unbiased judge and would rule on all disputes with absolute fairness and in justice with the questions under discussion, this clause would be fair to all parties. Unfortunately such is not the case, because in the majority of cases, the architect takes the stand that he is representing the owner and consequently rules in the interest of the owner.

Consequently every contract should have a clause naming some standard method of arbitration, in case of all disputes between the owner or his representative and the contractor. A third party, chosen by both should be made the arbiter and his decision should be binding on all parties to the contract.

Payments

"The contractor for the electrical equipment of the building shall be paid as follows: The contractor shall submit bills every 30 days and be paid 40 percent of the cost of all material and equipment delivered in good condition to the job. He shall receive an additional 25 percent of the cost of all material and equipment installed and connected ready for service. He shall furthermore receive the balance of 35 percent on completion of all tests and upon approval and acceptance by the architect."

A clause of this nature is very costly to a contractor as it makes a contract hard to finance, unless he can afford to tie up large sums of money over a considerable period. He will find that he has to wait until completion of his contract before realizing any substantial payment. The common form of "payments on account" whereby the contractor renders a bill once a month for payment of 85 percent of the value of the work executed and satisfactorily in place is much more satisfactory from the contractor's standpoint. Otherwise the contractor acts as the banker and ties up his capital till completion of his contract.

Bonds

"The contractor agrees to furnish the owner within ten days from date of signing the contract, with a satisfactory corporate surety bond in the sum of 50 percent of the contract price, assuring faithful performance of this contract and assuring payment by the contractor of all bills for labor, materials, supplies, etc., entering into the erection and construction of said building."

Although this clause distinctly calls for a 50 percent surety bond as a matter of fact, most of the large insurance companies would only write a surety bond for 100 percent of the contract, thereby causing the contractor to pay a larger premium than he would estimate upon, if his estimate was based upon the actual wording of this clause.

Underwriters' Approval

"The work must conform in every way to the rules and regulations of the local Board of Fire Underwriters having jurisdiction and upon completion a certificate of approval must be furnished to the architect or owner and paid for by the contractor.

"All work shown on the plans or described in the specifications must be made to conform with the National Electrical Code and anything shown on the plans described in the specifications to the contrary must be corrected at the contractor's expense."

This clause of the specifications casts doubt on the plans and specifications of the architect or engineer, and makes the contractor question whether he can take the plans and specifications in good faith or whether he will be compelled to make changes to comply with the Underwriters' rules. To obviate this difficulty all plans and specifications should be submitted for approval by the Underwriters before they are put out for estimates and contracts signed, so that the contractor will not be put to needless additional expense on completion of his contract.

Guarantee

"The contractor shall guarantee to make good any defects in his work, which may develop within one year from date of acceptance. Any material or workmanship that shall show any defect, will be replaced at the contractor's expense to the satisfaction of the architect."

As one may readily note, this clause was intended primarily, to protect the interests of the owner from inferior material or workmanship. When used legitimately, it will be found to work satisfactorily, and is fair to both owner and contractor. But unfortunately in the hands of an unscrupulous owner or architect it can be made to work a great hardship to the contractor, and cause him to be put to great expense for replacing of material and workmanship at the order of the architect. It would seem that all material and workmanship that complies with the terms of the specifications tested and approved by the architect should not have to be replaced in the period of one year and that something is radically wrong that required such replacement.

Drop

"The contractor is to so proportion all light feeders and branches that when the system is operating with all lamps burning, the drop in voltage between any lamps and the main service cut out shall not exceed three volts based upon the wattage as indicated at the individual outlets shown on the plans. The drop between the main power service cut out and the terminal of any motor, when all motors are running fully loaded shall not exceed five volts."

This is a very usual clause and is found in most specifications in general practice. On the face of it, it appears perfectly simple and fair to all parties. On closer inspection and in actual practice, one important detail stands out, which is namely the omission of the percent of load factor in the installation. For example, take the load on the lighting feeders. As every engineer knows this load may easily vary from fifty to seventy percent of full load, thereby making an appreciable difference in the size of the lighting mains. The load factor and the power factor should also be taken into account in the calculation of the power feeders as these may vary over a considerable range depending on the class of service.

It would therefore appear that these factors should be incorporated in this

clause, so that all parties might arrive at the same result in the computations of light and power feeders.

Other Contractors

"The electrical contractor shall connect up ready for operation all motors or other electrical devices supplied by the other sub-contractors whether shown on the plans or described specifically in these specifications. He shall provide and install necessary switches when not provided by the other contractors and do all work in accordance with Fire Underwriter's rules and in accordance with the terms of the specifications."

Any contract containing this clause would mean that the electrical contractor would have to search through the specifications of the plumbing, heating, ventilation or other mechanical work and try to discover what particular motors or other electrical devices furnished by them required switches and be prepared to wire and connect up such motors or devices ready for operation.

Any electrical specifications should either describe fully the work involved or else show clearly on the plans so that the electrical contractor would not be compelled to go through other specifications to find out the extent of his contract.

Many contractors have been put to additional expense when they have been required to connect up motors furnished by other contractors when these should have been specifically described in their specifications, and not under such a clause as this, which means he connects up any motors or devices overlooked by the architect or engineer.

Elevator Connections

"This contractor shall terminate the elevator power main in a fused safety switch. He shall provide and install any other necessary switches and connect up the elevator motor ready for operation."

This clause is an example of the loose manner of writing specifications in vogue with certain architects.

The contractor can be forced to install under this clause a reverse phase relay costing approximately ninety or one hundred dollars. It is good practice among more recent specifications to terminate at the elevator controller including a fused safety switch in the line, installed adjacent thereto.

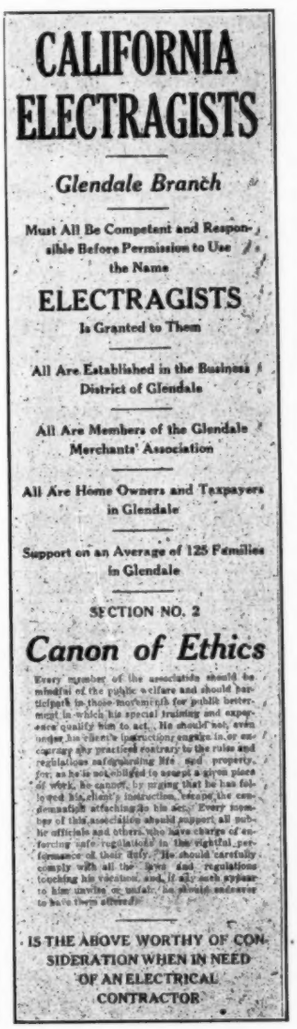
From the elevator controller and thence to the elevator motor and connecting up ready for operation is usually performed by the elevator contractor who also furnishes any necessary switches or reverse phase relays under his contract. This is distinctly specified in the elevator specifications and relieves the electrical contractor of the connection of the elevator motor.

In the foregoing, we have enumerated several clauses in standard specifications which have come to our attention and which are open to criticism. This list may readily be extended and no doubt every electrical contractor has during his experience been subjected to certain clauses in the specifications of his contract that have cost him considerable in the expenditure of time and money.

It is our opinion that specifications and plans should be so clearly drawn up and that all uncertain points be decided in advance so that the contractor knows just what he is to furnish and install, and the element of chance is removed from the contract.

Furthermore, one important feature is that "Joker Clauses" lead to unfair competition in preparing estimates. The contractor who is close to the architect knows what he will have to do under certain clauses and bids according. The other contractor takes into account what he might have to furnish and consequently bids high to protect himself. So that in the case of "Joker Clauses" the conscientious contractor figures to furnish and install a first class job complete in all respects, while his competitor may figure only on a minimum of equipment with just enough to get by.

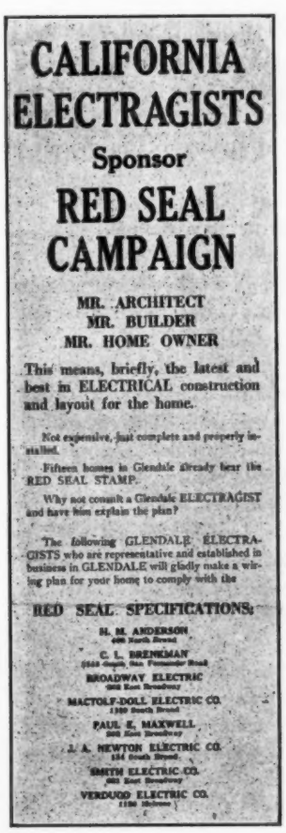
The Californians Tell What an Electragist Is and Does


CALIFORNIA ELECTRAGISTS
Glendale Branch
Must All Be Competent and Responsible Before Permission to Use the Name
ELECTRAGISTS
Is Granted to Them
All Are Established in the Business District of Glendale
All Are Members of the Glendale Merchants' Association
All Are Home Owners and Taxpayers in Glendale
Support on an Average of 125 Families in Glendale
SECTION NO. 2
Canon of Ethics
Every member of the association should be mindful of the public welfare and should participate in those movements for public betterment in which his special training and experience qualify him to act. He should not, even under his client's instructions, engage in or encourage any practices contrary to the rules and regulations safeguarding life and property, for, as he is not obliged to accept a given piece of work, he cannot, by urging that he has followed his client's instructions, escape the condemnation attaching to the act. Every member of this association should support all public officials and others who have charge of enforcing safe regulations in the rightful performance of their duty. He should carefully comply with all the laws and regulations touching his vocation, and, if any such appear to him unwise or unfair, he should endeavor to have them altered.
IS THE ABOVE WORTHY OF CONSIDERATION WHEN IN NEED OF AN ELECTRICAL CONTRACTOR

WHEN the electrical contractor-dealers' national association adopted the name, "Electragist," some years ago, it was felt this would help to identify in the minds of the public the men who stood for a high quality of work and a high quality of merchandise. Like all coined words, it has been taken some time to catch on with the public. This process, however, can be speeded up by using the very common means of spreading any gospel—advertising.

It is a method that the Glendale branch of the California Electragists have gone in for strongly. The local papers regularly carry such advertisements as are reproduced on the right and the left, and reports are that the local members of the association are gaining recognition through such advertising.

In addition, every issue containing such advertisements also carries individual announcements of each contractor, scattered throughout the paper and referring by page number to the large advertisement.


CALIFORNIA ELECTRAGISTS
Sponsor
RED SEAL CAMPAIGN
MR. ARCHITECT
MR. BUILDER
MR. HOME OWNER
This means, briefly, the latest and best in ELECTRICAL construction and layout for the home.
Not expensive, just complete and properly installed.
Fifteen homes in Glendale already bear the RED SEAL STAMP.
Why not consult a Glendale ELECTRAGIST and have him explain the plan?
The following GLENDALE ELECTRAGISTS who are representative and established in business in GLENDALE will gladly make a wiring plan for your home to comply with the
RED SEAL SPECIFICATIONS:
H. M. ANDERSON
C. L. BRENKMAN
BROADWAY ELECTRIC
MACTOLF-DOLL ELECTRIC CO.
PAUL E. MAXWELL
J. A. NEWTON ELECTRIC CO.
SMITH ELECTRIC CO.
VERDUGO ELECTRIC CO.

How to Lay Out Power Wiring According to New Code

By ROBERT A. GOELLER
Vice-President, Hatzel & Buehler, Inc., New York

(Conclusion)

This installment concludes Mr. Goeller's series on the various regulations of the 1925 Code pertaining to the protection of motors and motor circuits. It is to be hoped that our readers have preserved these articles since study of the series will enable the contractor with the motor wiring job not only to understand more thoroughly the various Code rules as applied thereto, but to select the most economical permissible type of system for various conditions of service.—Editor.

Diagram No. 7

Diagram No. 7 shows generally the type of motor circuit where individual motors are tapped off a common main and treats entirely with the Code requirements of the mains and the single motor branch taps up to the point where they connect to the motor starting and protective device. The Code requirements for that portion of the circuit between the starting device and the motor has been covered in previous installments.

In making a study of motor circuits of this character, the reader is referred to Section 808b which permits branch tap conductors supplying current to a single motor, when they are suitably protected from mechanical injury, to be considered as sufficiently protected by the fuses or circuit-breakers next back on the line if the carrying capacity of these conductors is at least one-third of that of the wire to which they are connected and if their length from the point of tap to the motor protective devices does not exceed 25 ft. However, this one-third capacity must always be checked to make sure that it does not bring the branch conductor down to a size that is below 100 per cent of the name plate rating of the motor as required by Section 808a. Should the motor size require branch conductors above one-third the capacity of the mains they must be calculated on the basis of 110 per cent regardless.

In permitting the above practice the Code qualifies Section 805c which requires a fuse or circuit-breaker to be placed at every point where a change is made in the size of an ungrounded wire. Practical installation conditions have undoubtedly brought about what might be considered as a special privilege to the motor wiring field, although a very logical one, for usually the motor mains are installed in high inaccessible places where fuses would be extremely unhandy to reach if placed at the point where the single motor branch tap is taken from the mains. Also there would be the problem of terminating the branch tap conductors on the starting equipment if they were required to be the full size of the mains, especially when the terminal lugs and gutter spacing of the starting equipment is based on a much smaller ampere capacity than the capacity of the conductors.

Admittedly this practice leaves such single motor branch tap conductors over-fused continuously but, as their length is limited and their installation guarded by requiring that they be suitably protected from mechanical injury, the danger of injury to them is small for under conditions of short circuit their one-third size would be ample to carry momentarily the currents necessary to blow the fuses next back on the line.

Oftentimes open work is employed for motor mains in the interest of wiring economy. Where single motor branch taps are taken from such mains and are reduced one-third in size, such taps would have to be installed in conduit or guarded by other suitable means in order to comply with Section 808b.

Under the conditions where the mains are open work construction and the single motor branch taps are in conduit, the determination of the size of the latter must be based on their ampere capacity in conduit which would come under column A of Table 1, Section 610. The following example will bring out this point more clearly.

EXAMPLE 1

Size of openwork main 500,000 C.M.
500,000 C. M. cable based on table C— 600 Amps.
1/3 of 600 amperes based on table C— 200 Amps.
200 Amperes based on table A—200,000 C.M. Conductors for single motor branch tap.

Table I following gives the smallest

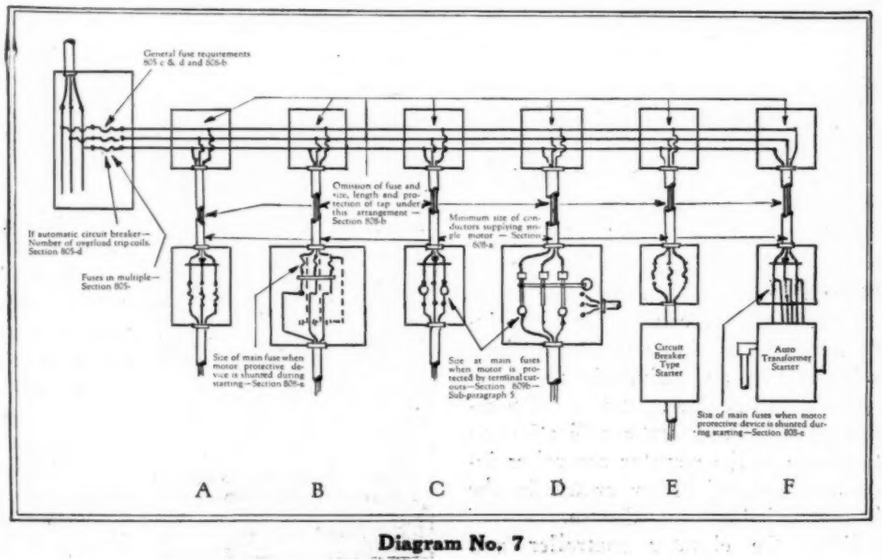

General fuse requirements 805 c & d and 808-b
Omission of fuse and size, length and protection of tap under this arrangement — Section 808-b
Minimum size of conductors supplying single motor — Section 808-a
If automatic circuit breaker—Number of overload trip coils. Section 805-d
Fuses in multiple—Section 805-
Size of main fuse when motor protective device is shunted during starting—Section 808-a
Size at main fuses when motor is protected by terminal cutouts—Section 809b—Sub-paragraph 5
Circuit Breaker Type Starter
Auto Transformer Starter
Size of main fuses when motor protective device is shunted during starting—Section 808-c
A
B
C
D
E
F

Diagram No. 7

size single motor branch tap that may be connected to a main without fuse protection as permitted by Section 808b and assumes that both the mains and single motor branch taps are in conduit with conductors having rubber covered insulation, as under column A of Table 1, Section 610.

TABLE I.
SMALLEST R. C. BRANCH MOTOR TAPS PERMITTED WITHOUT FUSE PROTECTION WITH R. C. MAINS

Mains		Branch Taps		Mains		Branch Taps	
Size	Table "A" Rubber Insulation — Amperes	Size Based on 1/3 size of mains	Table "A" Rubber Insulation — Amperes	Size	Table "A" Rubber Insulation — Amperes	Size Based on 1/3 size of mains	Table "A" Rubber Insulation — Amperes
14	15	14	15	200M	200	4	70
12	20	14	15	4/0	225	3	80
10	25	14	15	250M	250	2	90
8	35	14	15	300M	275	1	100
6	50	12	20	350M	300	1	100
5	55	12	20	400M	325	1/0	125
4	70	10	25	500M	400	2/0	150
3	80	8	35	600M	450	2/0	150
2	90	8	35	700M	500	3/0	175
1	100	8	35	800M	550	200M	200
1/0	125	6	50	900M	600	200M	200
2/0	150	6	50	1000M	650	4/0	225
3/0	175	4	70				

TABLE II.
SMALLEST R. C. BRANCH MOTOR TAPS PERMITTED WITHOUT FUSE PROTECTION WITH V. C. MAINS

Mains		Branch Taps		Mains		Branch Taps	
Size	Table "B" Varnished Cloth Insulation — Amperes	Size Based on 1/3 size of mains	Table "A" Rubber Insulation — Amperes	Size	Table "B" Varnished cloth Insulation — Amperes	Size Based on 1/3 size of mains	Table "A" Rubber Insulation — Amperes
6	60	12	20	350M	360	1/0	125
5	65	10	25	400M	390	2/0	150
4	85	8	35	500M	480	3/0	175
3	95	8	35	600M	540	200M	200
2	110	6	50	700M	600	200M	200
1	120	6	50	800M	660	4/0	225
1/0	150	6	50	900M	720	250M	250
2/0	180	4	70	1000M	780	300M	275
3/0	210	4	70				
200M	240	3	80				
4/0	270	2	90				
250M	300	1	100				
300M	330	1/0	125				

TABLE III.
R. C. BRANCH MOTOR TAPS IN CONDUIT FROM OPEN WORK MAINS

Mains		Branch Taps		Mains		Branch Taps	
Size	Table "C" Other Insulation — Amperes	Size Based on 1/3 size of mains	Table "A" Rubber Insulation — Amperes	Size	Table "C" Other Insulation — Amperes	Size Based on 1/3 size of mains	Table "A" Rubber Insulation — Amperes
8	50	12	20	250M	350	0	125
6	70	10	25	300M	400	2/0	150
5	80	8	35	350M	450	2/0	150
4	90	8	35	400M	500	3/0	175
3	100	8	35	500M	600	200M	200
2	125	6	50	600M	680	250M	250
1	150	6	50	700M	760	300M	275
1/0	200	4	70	800M	840	350M	300
2/0	225	3	80	900M	920	400M	325
3/0	275	1	100	1000M	1000	500M	400
200M	300	1	100				
4/0	325	0	125				

Table II differs from Table I only in that it is assumed that varnished cloth insulation will be used in place of rubber insulation on the mains and rubber covered for the single motor branch taps. The table is made up this way because No. 6 is the smallest V. C. conductor permitted (Section 610e) and is further harder to procure in small lengths and odd sizes required for short single motor branch taps.

Table III gives the relative sizes when the mains are open work construction and the single motor branch taps are in conduit using r. c. conductors.

The next problem which presents itself is to find out how a number of single motor branch taps may be connected to the mains so as to conform to Code requirements, especially where the type of starting apparatus and the size of the motors to be supplied from the same main are diversified.

Motor Branch Taps

Diagram No. 7 shows six single motor branch taps, each of them having a different type of starting device. The single motor taps are similar to those shown in diagrams 1 to 6 inclusive, with the exception that instead of terminating in a branch circuit power panel they tap direct on the mains without fuses. Because each type of motor starting and protective device requires individual consideration of the Code rules applying thereto and further study when there are several different types to be connected to the same main, each one will be discussed individually and in its relation to the others.

Single motor branch tap designated by the letter "A" shows a motor started at full voltage by means of a single throw switch and protected by same set of fuses during both starting and running periods and is similar, except as noted in the preceding, to Diagram No. 1. As this type of starting and protective device does not shunt out the protective devices during the starting period but leaves them continuously in circuit, the problem of fuse protection in the mains is quite simple. Thus any number of motors so protected may be tapped on to a main and the only considerations would be the size of the main to carry them, the fuse protecting it, and the size of the single motor branch tap between the main and the protective device, which, due to the small size of the motor switch, would have to be held down to a reasonable size for convenient connection. Motors with

this type of starting and protective device may be connected to mains supplying motors protected by any of the other types of starting devices without encountering any Code difficulties.

Single motor branch tap "B" shows a motor started at full voltage by means of a double throw switch so arranged that the running fuses are shunted during starting. It is quite evident under such an arrangement that during the starting period the motor is left without its usual protection. The Code recognizes the hazard of permitting a fuse or protective device unrestricted in size or setting to be used next back on the line for starting protection of the motor and thus Section 809f limits the rating of such fuses or setting of protective devices to 500 percent of the name plate rating of the motor. Where all the motors are of the same size tapping off a common main, the number that may be connected thereto is limited of course to 5 by the maximum size fuse or protective device up to 500 per cent of one of the motors. This number, while permissible under the Code does not give very much margin where perhaps four motors are running at full load and the fifth one is starting, and therefore it is suggested that some leeway be left to take care of this condition and the number of motors determined on the following basis:

EXAMPLE 2

Name plate rating each motor.....10 amps.
10 amps. × 500%.....50 amps.
One motor at 10 amps. × 200% for starting .....20 amps.
50 amps minus 20 amps. leaves.....30 amps.
30 amps. ÷ 10 amps. gives.....3 motors

The above is a personal recommendation, as there is nothing in the Code dictating the size of a main to take care of starting currents and in fact any number of motors could be connected to the main provided their combined operating characteristic did not blow the 50-amp. fuse. This subject is one of load factor about which there are many divergent opinions. A circuit designed according to this example has always proved satisfactory from practical experience.

Where, however, the motors are of different sizes the number of motors that may be connected to such a main is controlled by the smallest motor.

EXAMPLE 3

Name plate rating smallest motor....5 amps.
5 amps. × 500% rating.....25 amps.
This establishes the size of the main fuse and therefore to a large extent the number of additional motors that may be connected to it, as in
1 motor, name plate current rating 5 amps. .....5 amps.
1 motor, name plate current rating 6 amps. .....6 amps.
1 motor, name plate current rating 7 amps. × 200% for starting current of largest motor.....14 amps.
Total .....25 amps.

From the above it will be seen that the greater the diversity in the size of motors the fewer can be connected to the main.

When there are several large motors to be connected to a main together with one small one which might greatly limit the larger ones, it is possible that a fuse installed where the branch taps off the main, set at not over 500 per cent of the motor name plate rating, would work out in an economical manner.

Other Types

When other types of starting apparatus, as indicated in "C", "D" and "E", which do not shunt the motor running protective device during the starting period, are connected to a circuit of a type being described, the only consideration would be how many of them could be connected to the main whose fuse size would be governed by the smallest motor having a protective device which is shunted during starting.

When auto-transformer starters, which have the same characteristic as a double throw switch in that their motor protective devices are shunted during starting, are used, they may for purposes of Code discussion be considered in the same light as a double throw switch. The reverse is also true that double throw may be connected to mains supplying auto-transformer starters.

The single branch tap "C" connects a motor started at full voltage by means of a single throw switch but having thermal cutouts connected continuously in the circuit during both the starting and running periods, it is on account of the time delay feature that the Code has surrounded their use with a special protection.

It is readily appreciable that the time delay feature which permits the same cutout to be used for both starting and running periods creates some hazard within the cutout because the time delay feature may permit currents of considerable value to build up where a stalled or heavily overloaded motor is connected across the line; or where perhaps a short circuit or ground has occurred between them and the motor. It is quite possible that the thermal cutout might not have sufficient rupturing capacity to interrupt these currents without injury. Therefore it is evident that the next fuse back on the line should not be so large as not to be able to take care of such conditions. Thus Section 808b, sub paragraph 4, provides that "thermal cutouts shall not be used unless—next back on the line there are fuses of a rating with which the thermal cutouts can be used safely as indicated by the marking on the cutouts."

Here again we have a case where the smallest motor governs the size of the main fuse and therefore the number of motors that may be connected to a common main. The Code does not prescribe the size of fuse to be used in relation to the thermal cutout size, but from experience it has been observed that on sizes from 8-amp. downwards the fuses next back on the line may be up to thirty times larger than that of the thermal cutout and on heavier ampere ratings ten or more times larger. This permits a greater number of motors to be grouped on a common main than would be permitted where the motor protective device is shunted out of the circuit entirely during the starting period.

Thermal Cutouts

When thermal cutouts are connected to a main having any of the other types of starting and protective devices it is only necessary to see that the main fuse is not larger than indicated on the smallest thermal cutout.

Circuit "D" is exactly the same as that described under "C" and the same Code rules apply. The magnetic switch indicated is used for starting and stopping the motor through the medium of a start and stop push button located a distance from the starter. Any overloads are taken care of by the thermal cutouts in the same manner as though the switch were manually operated.

Circuit "E" indicates a circuit breaker type starter that may be of the manual or remote control type and so far as Code regulations are concerned permits of great flexibility where a number are connected to a common main.

In the first place this type of starter has overload relays or trip coils having a decided time lag which permits the motor to be connected direct across the line without causing the overload relays or trip coils to trip it out before

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Savings Through
Job Management

CHAPTER II*

Small Jobs
Care of Tools
Employing Men
Duties of Foremen
Relations with Other Trades

By M. S. MacNAUGHT

THE proper management of small job construction, such as houses, alterations and the like, differs considerably from the handling of the bigger projects, such as office buildings, factories, and similar structures. As the simpler problem, the small job will first receive consideration.

The labor item on the average house or small building contract is rather small, and under the stress of modern competition is likely to be quite closely figured. It is consequently to the interest of the contractor to have men on the job only when they can actually find plenty of productive work to occupy their time. To this end, these small jobs should be watched until it is absolutely essential to have an electrician at work. The superintendent normally can visit the building site once a week, talk with the general contractor's foremen, and so have a pretty good idea as to just when he must start his workmen.

Prompt Starting

At as near the last minute as the superintendent thinks safe, a journeyman should go on the job, arrangements being made to have stock arrive just as he gets there to receive it. He should stow this promptly and get started on his work with a minimum of lost time. This is essential, for time wasted puttering around arranging stock, or looking into petty details, is money lost to the contractor.

The superintendent should accompany his workman to the job, show him exactly how he wants the special or unusual parts of the work done, and before he leaves, he should be certain that the man is in complete possession of both facts and material so that he can work without interruption until the next visit of the superintendent.

Equally as important as getting the man to work without much lost time, he should be pulled off the job before he reaches the point where he is getting caught up and has too little to keep him busy. This calls for good judgment on the part of the superintendent, for obviously a man should not be taken off a job if there is danger of work being done by other trades which would later interfere with the proper installation of electrical work.

Several Small Jobs

The contractor who is fortunate enough to have several small jobs in process within a radius of a few miles can very efficiently use a good pair of men to handle them. Sometimes an electragist has a group of houses going along in one neighborhood, or several alteration jobs in the same locality, jobs which individually require only a few hours' each week, but which taken together offer plenty of work for a pair day after day. So long as travelling time between jobs does not become a weighty factor, this manner of handling several jobs at once will give very good results, and will greatly economize on time.

It almost goes without saying that the superintendent should never assign a man who is not entirely competent to handle the job under consideration. Many a good telephone man is all at sea on a concrete slab job, and some excellent pipe men are pitifully slow when they try to dodge beams with a fish wire. Specialists exist in our field, and in fairness to all concerned men ought to be sent out on work they are trained for. Then, and then only, can the electrical contractor have his work done with the least possible labor expense. It is of particular importance to consider the type of work when putting a man out on a small job with a restricted labor allowance.

Efficiency on the small job fairly shrieks for shipment of all possible material in one lot. The reason is this: If everything comes at once, the workman can store it carefully, sort it out for future use, and get the handling of material out of the way at once. Then he can devote all his future time to productive work, without being interfered with every few days by deliveries of material. Of course, breakable articles, such as fixtures, should not be sent to a job just starting, but a reasonable dividing line can be drawn, and shipments kept down to an absolute minimum. Another very real advantage to having few shipments is the reduction in teaming charges. This is a potent factor on a job involving a few hundred dollars. Five dollars for cartage is 22 percent of a $250.00 house contract—and as the majority of houses have electric work worth less than that sum, cartage becomes an even greater item.

Shop Assembling

As an aid in reducing the labor out on the job, material can sometimes be assembled, or machined, etc., at the shop or stock room. For instance, meter boards can be made up by a stock boy in his spare time, at a considerable saving over the same work done on the job. Or cutouts can be mounted in cutout boxes, ready for use, rather than shipping box and cutouts separately, leaving the assembly to a high priced journeyman. The same applies to drop

*Chapter I appeared in the August issue.

cords, fixtures, and similar material. *Do on the job, only that work which cannot be more economically done elsewhere.*

The use of tool chests, while not exactly a prodigious labor saver, is a material guardian, and hence worth considering. A chest, of adequate size, should be sent to every job, for use as storage space. The material used on the average job is a tempting morsel for the petty thief, and unless it is locked up, it soon disappears as light fingers beckon. As a preventive, all material not in actual use should be kept under cover, and securely locked. Even on a very small job, a fairly large and heavy chest should be sent, so that he who attempts to carry it away will have no easy job.

Tool Chests

On houses and such work, the electrician usually works a few days, then leaves for several weeks until the job has progressed to the point where he can do more work. During his absence, it may be desirable to shift his material, and unless it can be done easily, the general contractor will usually call the electragist and demand that one of his electricians take care of the moving. That costs money. If everything except conduit is packed in one or two strong chests, the general contractor's foreman will invariably have his own laborers do the moving, purely because he can do so quicker and easier than he can call up the electrician's office.

Tool chests, by the way, should be ruggedly built, and all the chests of one company should be equipped with a standard lock, so that if a key is lost, other keys will still be available, and it will not be necessary to break the lock. The practice of some workmen of shipping tool chests back to the shop filled with material is not desirable, for the chests cannot stand rough express or freight handling when heavily loaded. They cost good money, and some care should be taken so that they will last through several jobs.

At the end of a small job, another opportunity exists for the wide awake superintendent to save a few dollars. Instead of having the journeyman wait after work is done for the inspector to come, the superintendent can send his workman to another job, and himself make an appointment to be present at the inspection. This may very often save several hours of a man's time.

So far as the larger types of electrical construction are concerned, the production problem possesses two phases, efficient management of men and of material. With labor such a very important factor, and a tendency toward higher wages still evident, the matter of a few hours, or even minutes, at various points of the job is a subject for serious planning and effort.

If any one feature of the handling of men on a big job could be singled out as of maximum importance, it might well be the practice of keeping every man busy every minute, with plenty of work piled up ahead of each workman.

Too much stress cannot be laid on the fact that workers produce more when they see a whole lot of work in front of of them, and are being paced by other electricians, or by the other trades. Then there is no excuse for loafing; there is every incentive for speed, and installation of material proceeds rapidly.

The employment of men may be handled in two different ways, depending upon the location of the job. For work near the local office, foremen, journeymen and helpers should all be hired by the superintendent; incidentally, he should make it his business to know by reputation as many workmen as possible, and thereby aid his judgment in taking on new employees.

Local Workmen

For work so far away from home that men must board near the job, the added burden of living expenses can sometimes be avoided by locating a good man in the vicinity, making him foreman and giving him authority to hire such men as he needs. In this case, the man chosen should be known to the company by reputation, and arrangements should be made for more frequent inspections by the superintendent than might be the case if a tried foreman from the home shop was in charge.

In practically all cases of out of town work, the foreman alone needs to be sent from the shop. Once on the job, he can find the necessary help, thereby limiting the living expense costs to himself. There is no real justification for sending several men out on a job, and as noted above, with caution and capable superintendence, it may even be possible to use local workmen only.

In any case, the foreman should be instructed as to any special features of the job with which he may not be thoroughly familiar. Mistakes must be avoided, for they are both expensive and embarrassing. The safest course is to be sure the foreman knows just what he is expected to do, and he should be taught to communicate immediately with the office if he is in doubt.

Not only must the foreman be taught every detail of his job, but he must know when to order material, or call the office to have it shipped. Foresight is an acquired quality, and can be learned by any intelligent workman if he tries. It is essential for the man who wishes to handle a big job, for should he be unable to look ahead a few weeks and foresee his problems, he is sure to find himself in vital need of material which, through his failure to order at the right time, cannot be obtained.

Foreman Ordering

The foreman can very often order more effectively if he is given one of the large type of jobber's catalogue. These are remarkably complete, containing catalogue numbers, illustrations and data relating to many standard lines of material. He should also have a telephone handy for if he must go several blocks to a public phone whenever he calls the office, the lost time involved becomes a rather large item. Then, too, he should have a shanty and an ample supply of tool chests. The shanty, as his own private office, gives him a place to keep his plans, study them in relative privacy, store valuable tools, and provides a place for the safekeeping of men's clothing and kits. A shanty of the portable type can be bought for well under $100, requires little time to erect, is easily shifted, and can be used on job after job, making the proportionate cost per job rather low.

The electrical foreman on any job soon finds that he cannot go directly to work and put his conduits, cabinets, and other equipment in the exact locations shown on his plans, because plumbers, heating men and similar tradesmen must also locate their apparatus, often several trades being required to install pipes and equipment in very limited space. Such conditions as these call for an amiable foreman, well able to meet the foremen of other contractors and cooperate with them.

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The Machinery for Revising the Code

By A. R. SMALL,
Chairman, Electrical Committee, N. F. P. A.

The National Electrical Code is an American Engineering Standard. That is one way of saying that it represents the best thinking of every interested industry. Another way of saying the same thing is to show in some detail exactly how the machinery for revising the Code is set up and how it functions. THE ELECTRAGIST *has been fortunate in securing such an authoritative article from the pen of the man most competent to prepare such an article—the chairman of the Electrical Committee, N. F. P. A.—The Editor.*

DURING its thirty-year history, the National Electric Code has been the product of a meeting of minds of representatives of national bodies concerned in its field of application. This fact is the primary force responsible for the status of the Code throughout the land and for the very general recognition and support accorded its provisions by regulatory bodies, municipal or other, and by the producers and users of electricity. It is impossible to calculate the assistance this cooperation has given the growth in recognition and application of the use of electricity for light, heat and power within buildings which the public has encouraged and permitted in the period.

The Sponsor

The National Fire Protection Association was organized in 1907 to "Promote the Science" and "Improve the Methods of Fire Protection and Prevention." Its membership is of two classes, active and associate (or individual). The latter group includes over 4,100 names, from each of the states and provinces and from 31 other national divisions. The active membership comprises about 140 "National Institutes, Societies and Associations interested in the Protection of Life and Property against Loss by Fire." Contrary to a general impression, barely one-half of the active membership is connected in any way with the business of fire insurance, except as a purchaser thereof. Active members pay annual dues of $60 and have six votes each on roll call at meetings. Associate member dues are $10 per annum with one vote on roll call. Associate membership is open to any individual on payment of dues.

The National Fire Protection Association maintains a small executive office staff at 40 Central Street, Boston, in charge of the secretary-treasurer, Franklin H. Wentworth, and assistant secretary, R. S. Moulton. The other officers, and the members of the executive committee are elected from the membership. For the current year they are:

President, Dana Pierce, president, Underwriters' Laboratories, Chicago; vice president, A. M. Schoen, chief engineer, Southeastern Underwriters' Association, Atlanta; vice president, Frank C. Jordan, secretary, Indianapolis Water Company, Indianapolis.

Executive Committee: A. T. Bell, vice president, Leeds & Lippincott Co., Atlantic City, chairman; Past President H. O. Lacount, manager, inspection department, Associated Factory Mutual Fire Insurance Company, Boston; Past President R. P. Miller, consulting engineer, New York; Eugene Arms, manager, Mutual Fire Prevention Bureau, Chicago; W. H. Blood, Jr., vice president, Stone & Webster, Inc., Boston; George W. Booth, chief engineer, National Board of Fire Underwriters, New York; George Elliott, director of public safety, Philadelphia; George Greenfield, fire prevention engineer, Canadian Car and Foundry Company, Montreal; Clarence Heller, consulting engineer, San Francisco; S. D. McComb, manager, Association of Marine Underwriters, New York; H. L. Miner, manager, Fire Prevention Division, E. I. du-Pont de Nemours Company, Wilmington; F. T. Moses, vice president, Firemen's Mutual Insurance Company, Providence; W. W. Orr, secretary, New York Credit Men's Association, New York; Hickman Price, assistant to the president, Motion Picture Producers and Distributors of America, New York; Summer Rhoades, secretary, New York State Fire Insurance Rating Organization, New York; Paul W. Terry, manager, Missouri Inspection Bureau, St. Louis, and Louis Wiederhold, Jr., secretary, Underwriters Association of the Middle Department, Philadelphia.

In addition to the Electrical Committee, the N. F. P. A. has twenty-five other standing technical committees each in charge of an important standard. Several of these are so organized as to qualify as Sectional Committees under the Rules of Procedure of the American Engineering Standards Committee.

The National Fire Protection Association does not dictate to its technical committees as to procedure, etc., further than the following:

Committee's Procedure

Article 9—It shall be the duty of the President, Vice Presidents and Secretary, subject to the approval of the Executive Committee, to authorize and appoint special committees as occasion may require.

Regulations Governing All Committees

Article 4—The President shall be ex-officio a member of all committees except the nominating committee, and may appoint as his representative any other officer of the Association.

Committee Chairmen should notify the President of all meetings of their committees in order that he may be present in person or by representative should he desire to do so.

Voting by Proxy

Voting by proxy at meetings of special committees shall not be permitted, but any member of a committee may send a special representative to express his views in the deliberations of the committee and deposit his vote.

Alternates

Any special committee may by majority vote authorize any of its members to designate an alternate who shall be privileged to attend the meetings and, in the absence of the regular member, to vote in his stead.

Regulations Governing Technical Committees' Reports

(a) Except by unanimous consent, no technical committee report shall be presented to the Association in annual meeting which is not received by the Secretary before March Fifteenth of that year for advance publication. Such reports shall have been submitted to vote of the committee and must have received the approval of the majority of those voting. A statement in the following form shall accompany every committee report:

This report has been submitted to ballot of the Committee which consists of ..... members, of whom ..... have voted affirmatively, ... negatively, and ..... have refrained from voting.

Dissenting members shall have the right to present minority reports, individually or jointly, at the annual meeting at which the majority report is presented.

(b) Proposed new standards or proposed amendments to existing standards must originate in the particular committee within whose province such standards properly belong, and be presented to the Association in annual meeting for consideration and action.

The Electrical Committee Membership

The Electrical Committee is a technical committee of the National Fire Protection Association. Its chairman is selected by the executive office of the N. F. P. A. subject to confirmation by its executive committee. Although this is an A. E. S. C. sectional committee, it is primarily the N. E. P. A. Electrical Committee, and the parent body has gone on record as insisting on its right to name the chairman of its own committees. In the present instance, in addition, the Electrical Committee Chairman was elected Chairman of the Sectional Committee A. E. S. C. as organized.

A reorganization of the representation in the Electrical Committee was accomplished during the fall of 1924, by which the requirements as to balance of the American Engineering Standards Committee were satisfied. As now constituted the personnel includes, in addition to the original N. F. P. A. representatives, delegates from twenty cooperating bodies. Certain of these have two members as indicative of a major interest in the Code activity.

Each representative is appointed by the N. F. P. A. as required by the committee procedure above given. The cooperating delegates are appointed following nomination by their respective organizations.

Electrical Committee Organization

Prior to its organization as a Sectional Committee the Electrical Committee had few settled rules of procedure. Its organization was likewise along loose or simple lines. With the enlargement, both as to numbers and interests represented, additional rules and a detailed organization have become necessary.

When, in 1923, a complete editorial revision of the Code was accomplished, the present sub-division of the Electrical Committee into Article Committees naturally followed. This has worked out well except that certain articles or chapters require or invite more than their proportional shares of time and attention of their committee members, notably Articles 5, 8, and 9. This organization of the Electrical Committees into Article Committees was determined upon at a special meeting in November, 1924.

The chairman of the Electrical Committee appoints the chairmen of the Article Committees. Their appointments are presumably for the fiscal year of the committee, February to February, but as a matter of fact encumbants continue unless they indicate a desire to retire.

The personnel of the Article Committees is appointed by the chairman of the Electrical Committee, and technically the term is the fiscal year; actually the members continue to serve as long as they desire provided they prove really interested and active.

PERSONNEL OF THE ELECTRICAL COMMITTEE, N. F. P. A.

American Electric Railway Association, R. L. Weber, Stone & Webster, 140 Milk Street, Boston, Mass.

American Institute of Architects, Leroy E. Kern, 19 West 40th Street, New York, N. Y.

American Institute of Electrical Engineers, John Price Jackson, New York Edison Company, 130 East 15th Street, New York, N. Y. Alternate—Farley Osgood, 31 Nassau Street, New York, N. Y.

Association of Edison Illuminating Companies, J. W. Cowles, The Edison Electric Illuminating Company of Boston, 39 Boylston Street, Boston (10) Mass. Alternate—Frank V. Magalhaes, New York Edison Company, 708 First Avenue, New York, N. Y.

Association of Electragists, International, Allan Coggeshall. Alternate—Robert Goeller, both of Hatzel & Buehler, Inc., 373 Fourth Avenue, New York, N. Y.; A. Penn Denton, Denton Engineering and Construction Company, 512 Southwest Boulevard, Kansas City, Mo.; Alternate—W. Creighton Peet, 70 East 45th Street, New York, N. Y.

Associated Manufacturers of Electrical Supplies, C. A. Bates, Bryant Electric Company, Bridgeport, Conn.; Alternate—Charles R. Boggs, Simplex Wire and Cable Company, Cambridge, Mass.; H. R. Sargent; Alternate—H. G. Knoederer, both of General Electric Company, Bridgeport, Conn.

Bureau of Standards, Washington, D. C., Dr. M. G. Lloyd; Alternate—Arthur M. Halsted, both of Bureau of Standards, Washington, D. C.

Electric Power Club, C. L. Kennedy, Holtzer-Cabot Electric Company, 125 Armory Street, Boston Mass.; Alternate—W. S. Edsall, Condit Electric Manufacturing Company, 838 Summer Street, South Boston, Mass.; R. W. E. Moore, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.; Alternate—Louis Larsen, Sundh Electric Company, 5 Avenue C, Newark, N. J.

Electrical Supply Jobbers' Association, Thomas J. Craighead, Craighead Engineering Company, Cincinnati, Ohio; W. A. Kennedy, Sibley & Pitman Electric Corporation, 190 Sixth Avenue, New York, N. Y.

Illuminating Engineering Society, John A. Hoeveler, Pittsburgh Reflector Company, Third and Ross Streets, Pittsburgh, Pa.; Alternate, A. B. O'Day, Edison Lamp Works of General Electric Company, Harrison, N. J.

Institute of Radio Engineers, Donald McNicoll, 132 Union Road, Roselle Park, N. J.

International Association of Industrial Accident Boards and Commissions, Dr. Lucien W. Chaney, Bureau of Labor Statistics, Washington, D. C.

International Association of Municipal Electricians, W. P. Briggs, Room 212 Municipal Building, New Bedford, Mass.

National Association of Building Owners and Managers, Clarence T. Coley; Alternate—Eugene Kretzer, both of Equitable Building, 120 Broadway, New York, N. Y.

National Electric Light Association, W. H. Blood, Stone & Webster, Inc., 140 Milk Street, Boston, Mass.; Alternate—Alexander Maxwell, N. E. L. A., 29 West 39th Street, New York, N. Y.; E. W. Lloyd; Alternate—A. P. Good, both of Commonwealth Edison Company, Chicago, Ill.

National Board of Fire Underwriters, John Ashmead, N. B. F. U., 85 John Street, New York, N. Y.

The Telephone Group, H. S. Warren; Alternate, K. L. Wilkinson, both of American Telephone and Telegraph Company, 195 Broadway, New York, N. Y.

Underwriters' Laboratories, Inc., Dana Pierce, 207 East Ohio Street, Chicago, Ill.; A. R. Small; Alternate, R. B. Shepard, both of 109 Leonard Street, New York, N. Y.

Western Association of Electrical Inspectors, W. S. Boyd; Alternate—J. S. Mahan, both of The Union, 175 West Jackson Boulevard, Chicago, Ill.

Representatives for the N. F. P. A., K. W. Adkins, Missouri Inspection Bureau, St. Louis, Mo.; L. P. Dendel, Michigan Millers Mutual Fire Insurance Company, Lansing, Mich.; Alternate, C. W. Gustafson, Mutual Fire Prevention Bureau, 270 East Ohio Street, Chicago, Ill.; Washington Devereux; Alternate—Robert M. Nesbitt, both of Philadelphia Fire Underwriters Assn., South 4th Street, Philadelphia, Pa.; J. C. Forsyth; Alternate—C. S. Cahaskie, both of New York Board of Fire Underwriters, 85 John Street, New York, N. Y.; M. B. Gleeson, Underwriters' Association of the Middle Department, 316 Walnut Street, Philadelphia, Pa.; Carl E. Hardy, electrical department, City of Oakland, Room 509, City Hall, Oakland, Cal.; C. B. Langdon, Factory Insurance Association, Hartford, Conn.; G. S. Lawler; Alternate—E. E. T[illegible]ington, both of Inspection Department, Associated Factory Mutual Insurance Companies, 184 High Street, Boston, Mass.; C. W. Mitchell, Board of Fire Underwriters of the Pacific, Merchants Exchange, San Francisco, Cal.; Alternate—H. E. Newell, National Board of Fire Underwriters, 85 John Street, New York, N. Y.; A. M. Schoen; Alternate—H. N. Pye, both of Southeastern Underwriters Association, Atlanta, Ga.; R. P. Strong; Alternate—G. Welman, both of Louisiana Inspection Bureau, New Orleans, La.; Ralph Sweetland; Alternate—J. S. Caldwell, both of New England Insurance Exchange, 18 Oliver Street, Boston, Mass.; Victor Tousley, Bureau of Electrical Inspections, City Hall, Chicago, Ill.; W. W. Vaughn, New York State Fire Insurance Rating Organization, Syracuse, N. Y.

[N. B. list corrected to August 1, 1926.]

It is understood that any member of the Electrical Committee desiring to serve on a particular Article Committee will be appointed to that Article Committee by the chairman of the Electrical Committee unless it so happens that that organization is already represented on that committee, in which case it has been felt that a single representative of an organization is sufficient.

Alternates may serve on Article Committees with the same status as members. Hence sixty experts are available. Naturally, various members serve on one or more committees as their activities suggest a particular interest.

There is some feeling that an Article Committee membership should be expanded to include representatives of every interest and to have so-called balance. This, obviously, would result in the membership being unnecessarily enlarged and in a number of the members being watchers instead of active workers. It is our own view, but not entirely supported by the Electrical Committee membership that the need for so-called balance is taken care of entirely in the Electrical Committee personnel and that the membership of Article Committees may properly be kept reasonably small to be sure of at least a majority attendance at meetings. In one or two cases an organization has nominated one of its representatives or their alternates on the Electrical Committee to membership in an Article Committee. I have treated this as the equivalent of a request from the individual for appointment and have acted accordingly.

The present rules of procedure of the committee do not recognize a national body as directing the activities of its representatives or their alternates in the committee work. It may very well happen that rules of procedure now under consideration by a special committee will produce a different practice.

The present Article Committee assignments are given below.

Technical Sub-Committees

In addition to Article Committees, the plan of organization provides for so-called technical sub-committees. These are appointed from time to time by the chairman of the Electrical Committee, when, after consultation with the chairman of an Article Committee, it appears likely that a special topic requires expert investigation and consultation of various interests.

A technical sub-committee reports to the Article Committee and not to the Electrical Committee direct. The Article Committee is thereby continued as the custodian of all matters within its scope. Technical sub-committee memberships may include members or alternates of the Electrical Committee whether or not already members of the Article Committee and any other individual whose knowledge of the problem is judged to be helpful. The decision as to appointment rests with the chairman of the Electrical Committee. His selections are to secure technical assistance rather than to provide for balance of interest. The latter matter is competently cared for in the Electrical Committee makeup.

Technical sub-committees having assignments limited to a single topic are automatically disbanded when their report is received by the Article Committee.

The Article Committee is the sole sponsor of the work of the technical

CURRENT ASSIGNMENTS TO THE ARTICLE COMMITTEES

Article 1. *Definitions:* A. R. Small, chairman; M. G. Lloyd.

Article 2. *General:* A. R. Small, chairman.

NOTE: Committee on Article 2 also serves as Editorial Committee with respect to all articles.

Article 3. *Outside Work; Pole Lines:* M. G. Lloyd, chairman; K. W. Adkins, J. W. Cowles, C. E. Hardy, C. B. Langdon, G. S. Lawler, R. W. E. Moore.

Article 4. *Services:* M. G. Lloyd, chairman; C. A. Bates, Allan Coggeshall, J. W. Cowles, M. B. Gleeson, R. P. Strong.

Article 5. *Wiring Methods:* A. Penn Denton, chairman; W. H. Blood, W. S. Boyd, John A. Hoeveler, Thomas J. Craighead, H. G. Knoderer, W. W. Vaughn.

Article 6. *Conductors:* R. B. Shepard, chairman; Allan Coggeshall, T. J. Craighead, C. L. Kennedy, H. R. Sargent.

Article 7. *Outlet Boxes and Cabinets:* R. B. Shepard, chairman; C. A. Bates, A. Penn Denton, W. A. Kennedy.

Article 8. *Automatic Protection of Circuits:* J. C. Forsyth, chairman; C. A. Bates, Allan Coggeshall, J. W. Cowles, L. P. Dendel, E. E. Turkington, A. Halsted, R. W. E. Moore, Ralph Sweetland.

Article 9. *Grounding:* W. H. Blood, chairman; A. Penn Denton, John A. Hoeveler, M. G. Lloyd, C. W. Mitchell, H. G. Knoderer, M. B. Gleeson, R. P. Strong, V. H. Tousley, H. S. Warren, W. W. Vaughn.

Article 10. *Rotating Machinery and Its Control Apparatus:* G. S. Lawler, chairman; L. P. Dendel, A. Halsted, C. E. Hardy, C. L. Kennedy, C. B. Langdon.

Article 11. *Transformers; Under 600 Volts:* V. H. Tousley, chairman; M. B. Gleeson, John A. Hoeveler and R. W. E. Moore.

Article 12. *Switches:* A. Penn Denton, chairman; C. A. Bates, Dana Pierce.

Article 13. *Switchboards and Panelboards:* J. C. Forsyth, chairman; W. S. Boyd, C. L. Kennedy, H. R. Sargent, R. B. Shepard.

Article 14. *Fixtures, Lamp Sockets and Receptacles, Plug Receptacles and Other Outlet Devices:* C. A. Bates, chairman; R. B. Shepard, W. W. Vaughn, A. B. O'Day.

Article 15. *Lamps:* Allan Coggeshall, chairman; R. B. Shepard, A. B. O'Day.

Article 16. *Heating Appliances:* W. S. Boyd, chairman; J. W. Cowles, T. J. Craighead, R. B. Shepard, H. R. Sargent, V. H. Tousley.

Article 17. *Resistance Devices:* C. B. Langdon, Chairman; C. L. Kennedy, Ralph Sweetland.

Article 18. *Storage or Primary Batteries:* A. M. Schoen, chairman; J. W. Cowles, C. L. Kennedy, Donald McNicol.

Article 19. *Lightning Arresters:* G. S. Lawler, chairman; K. W. Adkins, C. L. Kennedy, A. M. Schoen.

Article 30. *Cranes and Hoists:* V. H. Tousley, chairman; Allan Coggeshall, M. B. Gleeson, A. Halsted, C. S. Lawler, R. W. E. Moore.

Article 31. *Elevators:* V. H. Tousley, chairman; A. Penn Denton, A. Halsted, C. E. Hardy, J. C. Forsyth, R. W. E. Moore.

Article 32. *Extra Hazardous Location:* L. P. Dendel, chairman; K. W. Adkins, C. L. Kennedy, M. G. Lloyd.

Article 33. *Garages:* Robert M. Nesbitt, chairman; C. S. Cahaskie, Allan Coggeshall, M. B. Gleeson, R. B. Shepard, V. H. Tousley, G. Welman, H. R. Sargent.

Article 34. *Motion Picture Studios:* John Ashmead, chairman; C. S. Cahaskie.

Article 35. *Motion Picture Projectors:* John Ashmead, chairman; C. S. Cahaskie, R. B. Shepard.

Article 36. *Organs:* John Ashmead, chairman; C. S. Cahaskie.

Article 37. *Radio Equipment:* Arthur Halsted, chairman; W. S. Boyd, C. A. Bates, T. J. Craighead, M. G. Lloyd, Donald McNicol, R. W. E. Moore, R. B. Shepard.

Article 38. *Signs and Outline Wiring:* John Ashmead, chairman; W. Devereux.

Article 39. *Theatres and Motion Picture Houses:* John Ashmead, chairman; W. Devereux.

Article 40. *Small Isolated Plants:* W. S. Boyd, chairman; L. P. Dendel, C. W. Mitchell, R. W. E. Moore.

Article 50. *Systems and Voltages of Over 600 Volts:* M. G. Lloyd, chairman; K. W. Adkins, J. W. Cowles, C. E. Hardy, C. B. Langdon, G. S. Lawler, R. W. E. Moore.

Article 60. *Signal Systems:* W. S. Boyd, chairman; William P. Briggs, John Ashmead, R. Sweetland, H. S. Warren.

sub-committee. It may endorse a technical sub-committee report and recommend its approval by the Electrical Committee verbatim, or it may suppress it entirely or submit a revised version. The technical sub-committee as such has no standing with the Electrical Committee, nor does the procedure provide for its report being submitted to the Electrical Committee except through the Article Committee.

Technical sub-committees now actively engaged are as follows:

Protection of Motors and Motor Circuits: E. E. Turkington, chairman; K. W. Adkins, F. A. Barron, L. P. Dendel, A. P. Good, H. D. James, E. McCleary, A. H. Kehoe, V. H. Tousley, F. D. Weber.

Committee on Sections 804 to 807, Inclusive: Allan Coggeshall, chairman; C. T. Cooley, P. D. Rapelje, H. F. Richardson, Joseph Sachs, George Sheridan, Frank Smith.

Diversity Factor for Lighting Loads: Theodore Josephs, chairman; C. S. Cahaskie, R. S. Hale, E. W. Muller, Ralph Ward.

Technical Sub-Committee of Committee on Article 37: R. B. Shepard, chairman; W. R. Arbuckle, F. A. Barron, C. A. Bates, W. L. Cook, T. H. Day, M. G. Lloyd, M. V. Lovell, D. McNicol, R. W. E. Moore, H. N. Pember, O. E. Smith, L. E. Whittemore.

Handling of Recommendations

The Electrical Committee meets annually in the latter half of February to receive reports from its Article Committees. A proposal for a change in the National Electrical Code, if not presented by a member or alternate at a meeting, must have had consideration and be endorsed by an Article Committee to be received. Proposals are made during the year. Most of them, and preferably so, are addressed to the chairman of the Electrical Committee, who automatically refers them to the appropriate Article Committee, usually through its chairman. Items originating in Article Committees as the result of study, conferences and discussions of its members are handled within the Article Committee and without reference to, or record by, the chairman of the Electrical Committee.

Up to date, so-called editorial changes of form and not of substance, or of corrections of omissions or errors in the printed text, have been handled by the editorial committee with or without notice or reference to the Electrical Committee, as the conditions in each individual case suggest.

Any observed conflict between two or more rules is referred to the Article Committees concerned with the texts which are in conflict, with a recommendation that the conflict be dissolved as the two committees may jointly agree.

Additional recommendations from the field are usually made direct to the chairman of the Electrical Committee and then relayed by him to the appropriate Article Committee. In some cases they are made to the chairman, or to one or more members of the Article Committee. Whatever their source, they must be considered and sponsored by an Article Committee to receive consideration and action at the Electrical Committee meeting.

New Products and Methods

The procedure with respect to rules necessary to permit the use of some new product or method could very well be identical with that for additional recommendations, an instance of this is the changes made for the 1926 Supplement intended to permit eventual recognition of tinsel cord for appropriate limited use. The general plan, so far as it is known, worked out with respect to a new method, the employment of which is in direct conflict with provisions of the Code, would be reference to an appropriate Article Committee and possible reference to a special technical sub-committee. It is presumed that a new method as described or presented would, on its own account, indicate the Article Committee to which it should be referred.

Underwriters' Laboratories has no formal relationship to the Electrical Committee. It is ready to be of service at the request of the Electrical Committee, an Article Committee or a Technical Sub-Committee. There has been more or less discussion in the past of several ways of establishing a more formal relationship, but nothing of the sort has so far been worked out and submitted to the Electrical Committee membership for consideration.

The electrical field secretary activity while still new and its relationship to the Electrical Committee and to Article Committees still to some degree a matter of experiment, is already demonstrating its value in the ascertainment of the needs of electrical inspection organizations for changes in the Code text, and the sponsoring of recommendations for such changes to appropriate Article Committees. The electrical field secretary's recommendations have an acknowledged weight of acquaintance with the demands of the national field and to that extent may naturally receive more deliberate consideration in an Article Committee than otherwise, but fundamentally the recommendations of the field secretary may be rejected by an Article Committee or otherwise handled as though the recommendations were from an outside source.

The procedure in balloting at the meetings is usually by a call for "ayes" and "noes" and a countercheck of hands if the chairman is in doubt. In the case of one of two controversial questions, a roll call has been taken for the information and guidance of the chairman in the preparation of minutes, but the roll call is not considered a part of the permanent records of the meeting's procedure.

A two-thirds vote of all members voting is necessary to pass. However, before such action is final it must receive the affirmative vote of two-thirds of all Electrical Committee members by letter ballot. Letter ballots are only taken at the conclusion of the business year when the minutes and the report of the committee to the sponsor body are submitted for review, correction or approval. However, exception has been taken to this procedure in the submission of the interim report of Article 5 Committee, embodying a set of compromise rules for section 507, to the Electrical Committee for letter ballot without meeting, in order to meet the request of the American Engineering Standards Committee that an effort be made to secure a greater unanimity of opinion on this rule.

A New Procedure

Heretofore Article Committees have reported to meetings without advance information to the membership, or the electrical public, of the nature or extent of its recommendations. For the February, 1926, meeting most Article Committees submitted their reports in writing well in advance of the meeting.

For the February, 1927, meeting a new procedure will have trial. No report of an Article Committee will be received or listed in the meeting's agenda, except by unanimous consent, unless included in a bulletin sent out to all cooperating interests thirty days in advance of the meeting. It is hoped that this plan will permit members to come to the meetings better informed as to the nature and probable bearing of various proposed changes and to learn, where desirable, in advance of

the meeting, the views of the organization they represent.

The Electrical Committee determines at each meeting whether or not the changes then agreed to, in its opinion, justify the publication of a new edition of the National Electrical Code or of a supplement thereto. Although it has never done so, the committee may properly take the view that the importance of the changes discussed and agreed to do not justify the upset of established practices which the publication and enforcement of a new edition necessarily involves. Except that the latter course is determined upon, the committee reports its findings or recommendations in specific form to the membership of the National Fire Protection Association with a recommendation for adoption by the latter body. The report of the Electrical Committee to the sponsor body has wide distribution previous to the annual meeting of the N. F. P. A. This, usually held in May, provides a forum and opportunity for appeal to those not satisfied with the recommendation of the Electrical Committee. Failure to make such appearance is a form of "sleeping on rights."

Assuming adoption of the report of the Electrical Committee by the sponsor at its annual meeting, two additional steps are taken prior to the publication of a new or supplementary edition. They are desirably, but not necessarily, consecutive rather than simultaneous. The first is to apply to the American Engineering Standards Committee for approval of the new text as an American Standard. The other is to file the text of the new form or of the Supplement with the National Board of Fire Underwriters with a recommendation for its adoption, printing and circulation.

A final step, entirely out of the sponsor's control, but essential to the operation of the new material, is the adoption and application of the new edition or of the supplement by the local body which is to enforce it. Most jurisdictions determine this as the result of local conferences. In some instances, such action is not taken until both the A. E. S. C. approval and the National Board circulation have been consummated. In other instances, adoption and enforcement immediately follows the formal action of the sponsor at its annual meeting. In the case of cities or other political sub-divisions, delays of months and years sometimes ensue because of local conditions obstructing prompt amendment of existing laws or ordinances. Generally those new items which are voluntarily employed in new work are immediately accepted by local authorities even though a considerable interval may elapse before they become mandatory.

Special Topics

In addition to the several Article Committees each with a single chapter of the Code for its exclusive scope there are several special committees which have in charge the matters indicated by their respective titles as follows:

Interpretations: Shall a Procedure of Formal Interpretations Be Set Up and if so Along What Lines? Small (chairman), Blood, Coggeshall, Forsyth, Sargent.

Safety Rules: Moore (chairman), Coggeshall, Craighead, Forsyth, Good, M. G. Lloyd, Pierce, Tousley.

Procedure: Moore (chairman), Denton, M. G. Lloyd, Pierce, Tousley, Wentworth, Wilkinson.

Control of Portable Devices: Bates (chairman), Briggs, Cahaskie, Goeller, Good, Kennedy, Nesbitt, Shepard.

Derived 3-Wire Interior Systems From Auto-Transformers Used as Balancing Coils: Hoeveler (chairman), Adkins, Briggs, Goeller, Pye.

In order that Article Committees may properly handle items referred to them, October 1 was agreed upon as the final day for receipt of requests or recommendations for Code changes for action at the following February meeting.

The intent of the procedure thus described is to provide that any and every suggestion from any source shall have due consideration by an Article Committee and further to assure opportunity for dissatisfied applicants to be heard by the sponsor body. It should be noted that items not endorsed by an Article Committee may not be presented to the Electrical Committee nor have mention in the Agenda published before its meeting.

Savings Through Job Management

(Continued from Page 40)

All too often the electrician's foreman will usurp space really needed by the plumber, for instance; this latter gentleman then has no recourse but to appeal to the architect with the usual result that the electragist must order his foreman to shift the objectionable work, a move which costs money.

Electricians must realize that their installation of conduits is somewhat more flexible than in the case of the vent man, or plumber, for unless these latter run their pipes "just so" their systems may later have poor operating qualities. Water, steam and air have confirmed habits, and the trades which work with them must work accordingly.

(To Be Continued)

Power Wiring According to New Code

(Continued from Page 38)

the motor gets up to speed. Secondly, overload currents are broken by the main contacts which usually are capable of interrupting a very heavy current without damage to them. It is therefore quite logical that the Code does not restrict the number that may be connected to a common main. Usually practical wiring conditions keep the feeder, and therefore the main fuse, down to a size that would not be disproportionate to the interrupting capacity of the circuit breaker. With this great flexibility it is quite logical that such a starter could be connected to a main having any of the other type starting devices, for the Code places no limits on the setting of the protective device behind the circuit breaker, as it does on thermal cutouts or devices that shunt the running protective devices during starting.

Circuit "F" shows an auto-transformer type starter which shunts the motor protective device during starting and in this respect it is identical to the starting arrangement shown under "B" with the same Code rules.

It will be noted in the accompanying diagram that no reference notes, other than those pertaining to the size of the main fuses are given for the various types of starters as these have already been given in detail in the previous diagrams.

Probably no other single type of wiring system has the problems of automatic overload protection or conductor size as have motor wiring systems and it is hoped that the diagrams, indicating as they do the various Code requirements at different points in the system and also the descriptive matter pertaining thereto, will be of some assistance to the Electragist enabling them to lay out motor wiring work in accordance with the Code rules and to take advantage of the economies that such knowledge permits.

The Electragist

Official Journal of the
Association of Electragists—International

S. B. WILLIAMS
Editor

H. H. STINSON
Associate Editor

Sheathed Cable Compromise Passes

The compromise rules on sheathed cable offered by the Association of Electragists have been carefully studied by Article 5 Committee and with some slight modification have passed unanimously. At this writing they are being voted on by the entire Electrical Committee of the N. F. P. A. by mail. There is every reason to believe that these rules will pass with hardly a dissenting vote.

It is expected that the poll will be completed in time for the N. F. P. A to resubmit the 1926 Code changes with these new rules to the American Engineering Standards Committee at its October meeting, when there is every assurance that the 1926 changes will become an American Engineering Standard.

The action of the N. F. P. A. Executive Committee in not permitting these changes to carry over a year before becoming an American Engineering Standard is most encouraging to those who have been working so hard to make the National Electrical Code truly national in application.

The Code today needs every friend it can secure. There are interests which would be glad to create dissension amongst the Code's friends in order to impugn the Code. So long, however, as the Code is an American Engineering Standard it has a position that no one interest can successfully assail.

Thus we hope that the last chapter in this unfortunate controversy is brought to a close. As much as every one wishes it could have been avoided, it has not been without value. It has served as nothing else could to focus attention upon the Code. It has shown that the Code is not the property of any single interest, but of all interests. It has shown that the Code is not a dead thing, but a living vital element of electrical progress. It has shown that being an American Engineering Standard is an asset of such importance to the Code that its friends will go to any limits to prevent it from losing that standing.

Electragist Standards

The committee has been appointed and work will begin during this month on the preparation of Electragist Standards of Wiring Specifications. It will be many months before anything concrete can be announced, as it is essential that the committee go slowly and carefully in order to be sure that what it proposes is workable.

So far the proposal has received the endorsement not only of the contracting branch of the industry, but from the officials of a large number of prominent manufacturers and jobbers.

The Electragist Standard will not be a new set of rules in that it will be in conflict with any thing we now have. Rather will it complement existing rules by showing how wiring should be installed in accordance with the most advanced ideas of permanence, efficiency, adequacy, good workmanship and safety.

The Wiring Conference

The joint conference to determine whether the cost of wiring or what is holding back progress in the use of electricity meets on the fifteenth and sixteenth of this month.

This conference to which is being sent four representatives each by the four national associations representing the four major branches of the electrical industry is one of the most serious and important activities ever undertaken.

It grew out of the assertion by the N. E. L. A. Wiring Committee that cheaper wiring was necessary in order to increase the consumption of electricity particularly in the home.

The Association of Electragists feels that maximum progress is possible only when all interests are pulling together. The manufacturers, the jobbers, the central stations, the contractors—all have a common purpose: The greatest possible use of electric service.

If the price of wiring is so high that it is retarding the growth of electricity, the contractors want to know it. Whatever retards growth, limits their opportunity.

On the other hand the contractors are not going to be satisfied with any statements that are not backed up by unassailable proof. Those who would defend the stand for cheaper wiring must be ready to prove conclusively that lower wiring prices, as the result of lower grade materials, will cause the public to demand more outlets and to consume more energy.

But since the central station organization has admitted that the use of electricity is not making the growth that it should and since it is satisfied the public would use more energy if the retarding influence were removed, the contractors insist on knowing what that retarding influence really is. They want it brought to light and if it be too high costs caused by too strict standards of wiring, or if

it be too high rates for energy or insufficient education of the public or what, they want to know it.

It has been a habit of the industry for years to blame the electrical contractor for inadequate wiring on the grounds that competition was causing cut prices which result in fewer outlets. No one can condone the practice of buying jobs through cut prices. On the other hand, what have the central stations done to educate the public? The electrical contractor does not take his profit out of the job month in and month out as the central station does. The latter can spend money for advertising and get it back in the rate, with an assured 8 percent profit. The electrical contractor gets but one profit, if any, and that very small. The electrical contractor feels this delinquency on the part of the central station very much.

This conference will do good in more than one way.

First of all, it is hoped that after careful study it will recommend an industry policy with respect to the best way to insure progress in the use of electricity.

Second, it will serve to show all branches how mutually interrelated are their interests.

Third, it will produce that kind of harmonious relations between the several branches that comes only with a proper appreciation of the importance of one to another.

Market Development

The amount of money spent by the American people for electrical products and wiring is measly when one stops to think how great is the room for improvement. The reason is due to the fact that we have each considered our selling as best done through individual effort. The result has been no concentrated, coordinated public education.

If the paint, plate glass, terra cotta, face brick and numerous other branches of the building industry can lift themselves by their own bootstraps through cooperative market development plans, think of what the electrical people can do.

The only difference is that the electrical industry aims to work out all its commodity programs through a coordinated national and local activity. As announced elsewhere in this issue, the Society for Electrical Development has worked out in detail a program to accomplish this activity through a close tie-in with local leagues.

With a national agency for national education, planning, working out details and policies and with a host of active local electrical leagues working locally there is no limit to what might be accomplished without that confusion that would undoubtedly arise if there were fifteen or twenty commodity programs, each operating independently.

Overalls Requirements

A pair of overalls meets the legal clothing requirements for the protection of public morals. It is about the minimum that one can safely wear on the street and not be arrested. But does the public demurr against being offered all kinds of excess clothing at high prices and demand the minimum requirements—the overalls?

Why should we think then that the public is going to be satisfied with the minimum electrical requirements?

When we find the public demanding the minimum in automobiles, homes, food, clothing, furniture, amusement, etc., etc., then perhaps we may talk minimum electrical standards.

An Inspector's Wage

We can make rules and codes, we can have license ordinances created, we can secure heavy fees and bonds in an effort to insure the public of good safe wiring by competent men, but after all it depends on the inspector. If he is honest, if he is on the job, if he knows his business the public will be protected.

Can we expect all this and still pay him starvation wages? Inspectors have a right to live, to enjoy a home, and bring up a family according to American standards of living.

If we do not pay the inspectors enough there are certain inevitable conclusions:

(1) We do not get competent men, or
(2) We do not get honest men, or
(3) If the men are both competent and honest they lack the courage to get out.

Can we get the best inspection under such conditions? Is there anything to protect the good contractor against the price cutter who expects to skin the job and get away with it?

Is this perhaps one of the answers to some of the price cutting? And if so would it not be worth while for the good contractors to secure for inspectors a wage that would be more in keeping with the responsibility involved?

Second Hand

How far should we go in permitting the use of second hand wiring materials in a new building?

A second hand motor may be put in "just-as-good-as-new" shape but can wire, pipe, sockets, etc., be salvaged from a building that is being torn down and used over again in another building?

The insulation on wire is very easily damaged. Is it not likely that wire which has come out of a wrecked building is injured? Likewise pipe? Is it not likely that its thickness is less after years of use? In fact, can it not be fairly said that virtually all wiring supplies that have been used are in a weakened condition?

While it may not be easy always to detect this material, nor its use as yet be widespread, it nevertheless seems advisable to give it some thought now. The amount of used material that is being salvaged is bound to increase.

If we are so careful about new material meeting the proper specifications, ought the use of second hand material be permitted?

Association of Electragists INTERNATIONAL

PRESIDENT, Joseph A. Fowler
118 Monroe Ave., Memphis, Tenn.

SECRETARY AND TREASURER, Laurence W. Davis,
15 West 37th Street, New York City

EXECUTIVE COMMITTEEMEN

Eastern Division
A. C. Brueckmann
314 Keyser Bldg.,
Baltimore, Md.

Mountain Division
E. C. Headrick,
87 Broadway,
Denver, Colorado

Southern Division
J. A. Fowler,
118 Monroe Avenue,
Memphis, Tenn.

Eastern Canadian Division
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Toronto, Ont.

Great Lakes Division
L. E. Mayer,
14 No. Franklin Street,
Chicago, Ill.

Western Canadian Division
J. H. Schumacher,
187 Portage Avenue,
Winnipeg, Man.

Central Division
A. Penn Denton,
512 South West Blvd.,
Kansas City, Mo.

Open Shop Section
J. F. Buchanan,
1904 Sansom Street,
Philadelphia

Pacific Division
C. L. Chamblin
687 Mission Street
San Francisco, Calif.

Union Shop Section
W. Creighton Peet
70 East 45th St.,
New York City

AT LARGE
G. E. Shepherd,
11 West Market Street,
Wilkes-Barre, Pa.

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14 No. Franklin St., Chicago, Ill.

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118 Monroe Ave., Memphis, Tenn.

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11 W. Market St., Wilkes-Barre, Pa.

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E. McCleary 1903-1905
James R. Strong 1905-1908
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*Marshall L. Barnes 1910-1912
Ernest Freeman 1912-1914
*Deceased
John R. Galloway 1914-1916
Robley S. Stearnes 1916-1918
W. Creighton Peet 1918-1920
James R. Strong 1920-1925

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List of Local Associations

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Wheaton (C)	E. C. Krage	133 West Front St.
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Lowell (C)	George A. Ryan	79 Middle St.
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Springfield (C)	A. R. Tullock	11-12 Court House Place
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Detroit (C)	N. J. Biddle	112 Madison Ave.
Grand Rapids (C)	T. J. Haven	1118 Wealthy St., S.E.
Kalamazoo	E. R. Hummel	1121 Seminary St.
Saginaw (C)	E. T. Eastman	209 Brewers Arcade
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Duluth (L)	Morris Braden	c-o Minn. Power & Light Co.
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Kansas City (C)	A. S. Morgan	4 E. Forty-third St.
St. Louis Electragists' Ass'n (C)	W. F. Gerstner	120 No. Second St.
Electric Employers' Association (C)	G. L. Gamp	Wainwright Bldg.

STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS
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Lincoln (L)	George Ludden	1329 N Street
Omaha (C)	E. H. Brown	1818½ Harney Street
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Independent (C)	Albert A. A. Tuna	127 East 34th Street
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Schenectady (C)	Richard Spengler	421 McClellan Street
Syracuse (C)	Fred P. Edinger	802 East Water St.
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Yonkers (C)	Louis Mayer	485 South Broadway
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OKLAHOMA		
Pawhuska	C. G. Sego	Pawhuska
PENNSYLVANIA		
Altoona (C)	Walter Bracken	Leechburg
Allegheny Valley	E. G. Jackson	12 West Third Street
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Pittsburgh (C)	Fred Rebele	1404 Commonwealth Bld.
Wilkes-Barre (L)	Ambrose Saricks	25 No. Main Street
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Providence (C)	H. E. Batman	36 Exchange Place
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Charleston (L)	J. P. Connolly	141 Meeting Street
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Toronto (C)	M. McRay	24 Adelaide St., N.E.
Vancouver (C)	J. C. Reston	579 Howe St.
Winnipeg (C)	Fred Ball	300 Princess St.

(C) designates exclusively Contractor-Dealer organization.
(L) designates an Electrical League

SEPTEMBER ACTIVITIES

Industry Wiring Conference to Take Place in New York on October 15

Appointment Announced of Personnel of Delegations Representing Central Stations, Manufacturers, Jobbers and Electragists

THE personnel, which is to compose the industry conference on wiring, has just been announced. This is the conference initiated jointly by the Association of Electragists, International, and the wiring committee of the National Electric Light Association, and it will be composed of delegations of four men each, representing the four major branches of the industry, under the chairmanship of Earl E. Whitehorne, commercial editor of *Electrical World*. The purpose of the conference will be to investigate the present trend of wiring in its influence upon the development of the electrical industry.

The membership of this conference will be as follows:

Representing the National Electric Light Association:

W. H. Blood, Jr., Stone & Webster, Boston, Mass., past president N. E. L. A.; member Electrical Committee, N. F. P. A.; insurance expert for N. E. L. A.

A. P. Good, chief inspector, Commonwealth Edison Company, Chicago, chairman wiring committee, N. E. L. A.

J. D. Noyes, engineer, Detroit Edison Company, Detroit, member wiring committee, N. E. L. A.

Charles J. Russell, vice president, Philadelphia Electric Company; past chairman national section, N. E. L. A.; joint author of Russell-Berger "Residence Load Survey."

Representing the National Electrical Manufacturers Association:

H. R. Sargent, engineer, General Electric Company, Merchandise Department, Bridgeport, Conn.; member Electrical Committee, N. F. P. A.; member standards committee Associated Manufacturers of Electrical Supplies; representative of manufacturers on matters relating to codes and wiring.

W. D. Barker, United States Rubber Company, New York, member wire and cable section A. M. E. S.

C. A. Bates, engineer, Bryant Electric Manufacturing Company, Bridgeport; member Electrical Committee, N. F. P. A.; member board of governors A. M. E. S., vice chairman standards committee, A. M. E. S.; member wiring section, A. M. E. S.

W. E. Sprackling, vice president, Tubular Woven Fabric Company, Pawtucket, R. I., chairman non-metallic conduit section, A. M. E. S., member conduit section A. M. E. S.

Representing the Electrical Supply Jobbers' Association:

G. A. Cullinan, vice president, Graybar Electric Company, New York, member executive committee E. S. J. A., chairman cooperative relations committee, E. S. J. A.

W. I. Bickford, secretary and treasurer, Iron City Electric Company, Pittsburgh, Pa., chairman Atlantic Division E. S. J. A.; chairman wire conductors committee E. S. J. A., member executive committee E. S. J. A.

W. R. Herstein, vice president, Wesco Supply Company, Memphis, Tenn.; chairman dealer cooperation committee E. S. J. A.

O. F. Rost, president Newark Electrical Supply Company, Newark, N. J.; member dealer cooperation committee E. S. J. A., member cooperative relations committee E. S. J. A.

Representing Association of Electragists, International:

J. A. Fowler, president, Fowler Electric Company, Memphis, Tenn., president A. E. I.

A. Penn Denton, president, Denton Engineering Company, Kansas City, Mo., member Electrical Committee N. F. P. A. and chairman of its Article Five Committee on wiring methods; chairman Code Committee A. E. I.

W. Creighton Peet, Peet & Powers, New York; past president A. E. I.; chairman Trade Policy Committee A. E. I.

G. E. Shepherd, Shepherd-Rust Electric Company, Wilkes-Barre, Pa.; chairman Wiring Methods Committee A. E. I.

The meeting of the Industry Conference on Wiring will be held at the Engineers' Club, New York, on October 15 and 16.

President Fowler Starts Transcontinent Trip

A swing around the circle, which will include visits to fourteen cities in the United States and Canada, was begun by Joseph A. Fowler, president of the Association of Electragists, International, on September 21. Mr. Fowler will go to the Pacific Coast, thence to the Northwest and Canada, and from there to Minneapolis, Chicago and New York. Arrangements have been made by the electrical contractors in each city he is scheduled to visit to have large meetings in his honor.

The itinerary of the presidential trip is as follows: Kansas City, September 22; Denver, September 23; Colorado Springs, September 24; Salt Lake City, September 27; Los Angeles, September 29; Del Monte, October 1; San Francisco, October 3; Portland, October 6; Seattle, October 7; Vancouver, October 8; Winnipeg, October 12; Minneapolis, October 13; Chicago, October 14; New York, October 15.

First Convention of Wisconsin Inspectors

The first meeting of the Wisconsin chapter of the Western Association of Electrical Inspectors was scheduled to be held on September 27 and 28, at the Republican Hotel, Milwaukee. A report of the meeting will be published in the November issue.

Lighting Manufacturers Plan National Exhibition

The Artistic Lighting Equipment Association, formerly the National Council of Lighting Fixture Manufacturers, is completing plans for a display of lighting equipment, embracing fixtures, wall brackets, floor, bridge and table lamps, metal furniture, industrial and commercial lighting units, illuminating glassware, shades, lighting equipment, accessories, parts and supplies of all kinds.

These displays and demonstrations will be a part of the National Exhibition to be held at the Hollenden Hotel, Cleveland, Ohio, January 31 to February 5, 1927.

Originally, this educational display was designed for the benefit of the dealer, architect, builder, jobber and electrical contractor. Certain hours and days, however, the exhibition will be thrown open to the public.

It is planned by the National Association of Lighting Equipment Dealers to hold their meeting and convention at the same time and place.

Portland Embodies Advanced Ideas in New Code

A new electrical code for the City of Portland, Ore, embodying a number of advanced ideas such as metal construction, load factors for feeder sizes, motor tables, etc., has just been put into effect. The compilation of this code, under the direction of L. W. Going, chief electrical inspector, makes it in many ways one of the best local codes ever written, not so much because of new matter as because it is self-interpretative.

The principal features of the new code are:

1. Adequate administrative provisions.
2. Licensing of contractors and examination of supervising electricians.
3. Licensing of dealers in electrical supplies, and prohibiting the sale of unapproved electrical appliances.
4. Adoption of all-metal wiring standard with definite installation rules for rigid and flexible conduit, armored cable, metal raceways, and metal wireways and with permissible wiring methods for various occupancies clearly indicated.
5. Standardization of fixture outlet fittings and detailed requirements for installation of such fittings.
6. Providing method for determining the minimum permissible number of circuits and size of feeders in any installation.
7. Adequate and flexible wattage requirements, including definite wattage limitations for branch circuits.
8. Detailed treatment of the subject, "Automatic Protection of Circuits, Appliances and Apparatus."
9. Detailed treatment of the subject, "Services, Service Switches and Cutouts and Meter Equipment."
10. Tables of motor wiring data which simplify the layout of power installations.
11. Illustrated grounding method with code references.
12. Detailed requirements for installation of fixtures in new and old buildings.
13. Regulations pertaining to life hazards with particular reference to panel boards, switch boards, safety switches, guarding live parts of motors and control equipment, and location of equipment.
14. Simplified arrangement of code rules and a comprehensive index.

Houston Association Writes Letter on Defective Wiring

In an effort to bring about the correction of defective and dangerous electrical installations throughout the city of Houston, the Master Electricians' Association of that community has sent out a letter to all contractors and builders, calling attention to the hazardous conditions and urging that all defective installations be corrected at once. The letter reads, in part, as follows:

"In taking a careful survey of our city we find many dangerous electrical installations, jeopardizing both the loss of life and property from electrical causes, and it is only for the fact of a merciful Providence that our daily papers have not added to an already long list of disasters of this nature.

"To correct these existing conditions as far as it may lay within our power, to advise and warn the public against having like installations made in the future, is one of the principal aims and objects of this association.

"This office is in a position to, and will gladly give to all without cost, any suggestion or advice pertaining to any electrical installation of any nature whatsoever.

"We assure you of the cooperation of this office in matters pertaining to the electrical industry and we ask your moral support in return."

Jobbers' October Meeting at Atlantic City

The semi-annual meeting of the Electrical Supply Jobbers' Association, it has been announced, will be held October 19-22 at the Traymore Hotel, Atlantic City, N. J.

Adequate Switching In New Pittsburgh Code

The new Pittsburgh Code, which becomes effective October 1, is based upon the Uniform Electrical Ordinance, but with a few additions.

All construction shall be in metal except for one-family dwellings where knob and tube is permitted except that the wiring in the cellar must be in metal.

At least one outlet in each room or hall shall be controlled by a wall switch located in that room, preferably near the door. All sockets within reach of persons standing or otherwise touching the earth or ground surface, such as cellars, floors, bathroom fixtures, kitchen sinks, etc., shall be controlled by a wall switch or switches.

The minimum service is No. 8.

When a contractor finishes a job he must attach at some suitable place on the installation his name and address.

Committee on Electragist Standards Named By President Fowler

Members Chosen for Their Engineering Training, Wide Experience in all Types of Installations and Close Relationship to Code Development

THE personnel of the special committee on electragist standards for wiring specifications, authorized by the 1926 convention of the A. E. I., has been named by Joseph A. Fowler, president, and it has been announced that the first meeting of the committee will take place in New York City, October 16.

The men who will have in charge the preparation of this important work are: A. Penn Denton, Kansas City, chairman; W. Creighton Peet, New York; Allan Coggeshall, New York; George E. Shepherd, Wilkes-Barre; A. C. Brueckmann, Baltimore, and J. H. Schumacher, Winnipeg.

President Fowler pointed out that the men making up this committee were chosen because of their engineering training, broad experience in electrical installations of all types in both the large cities and smaller communities, close relationship with the development of the National Electrical Code and because of the high standards maintained in the development of their own contracting organizations

It is expected that following the organization of this special committee a large technical advisory sub-committee will be appointed with representatives covering all parts of the country to assist in development of these standards.

Mr. Fowler pointed out that the purpose of this undertaking is to provide the building public with a definition of quality standards of wiring under all conditions commensurate with the building needs for sound investment, permanence and economy of operation, efficiency and adequacy of service, with full recognition of the rules for safety to life and property laid down in the National Electrical Code.

Such standards, Mr. Fowler stated, will provide the building public with a long needed measure of high quality wiring and will give to the contractor a means of selling a quality service for which he may receive compensation on a basis of general excellence rather than original cost alone.

Internal Revenue Rulings on Installment Sales

The Bureau of Internal Revenue has promulgated a number of regulations on the subject of what taxes must be paid on sales, when the sales are made on the installment plan. They are:

"*Installment Sales:* The law provides in Sections 212 (d), 232 and 1208 of the 1926 Revenue Act that sales may be treated as installment sales when made by (1) all regular dealers in personal property on the installment plan, (2) by other persons in a casual sale of personal property at a price exceeding $1,000, and (3) by all persons selling real estate, provided in either the last two cases the initial payment does not exceed one-fourth of the purchase price. The rule with respect to (1) is 'that a person who regularly sells or otherwise disposes of personal property on the installment plan, whether or not title remains in the vendor until the property is fully paid for, may return as income therefrom in any taxable year that proportion of the installment payments actually received in that year which the total or gross profits (that is, sales less cost of goods sold) realized or to be realized when the property is paid for, bears to the total contract price'."

New Winnipeg Ordinance Has Motor Tables

Copies of the new Winnipeg (Can.) Ordinance have recently come off the press. Some of the local rules are made necessary because there are two power companies operating in the city. There are, however, some rules that will interest other localities.

A set of motor tables appears, including one giving the maximum fuses allowable with thermal cutouts.

To minimize destructive heating of switches, cutouts and fuses on flat rate heating loads, the ordinance provides for excess capacity in switches and wires as follows:

RATING NAME PLATE	CAPACITY IN WIRES	SWITCHES REQUIRED
3 to 5 kw.	133%	30 amp.
Over 5 kw. and up to 18 kw. inclusive	125%	60 amp. up to 10 kw. 100 amp. up to 18 kw.
Over 18 kw.	120%	200 amp. up to 36 kw.

Accord Developing on Rules for Sheathed Cable

Letter Ballot to Electrical Committee on Compromise Rules Adopted by Article 5 Committee Expected to Produce Unanimity Asked by Standards Committee

AN END to the long-standing controversy over the rules for the installation of sheathed cable is apparently at hand. It has been announced by A. R. Small, chairman of the Electrical Committee, that N. F. P. A. compromise rules formulated by the Article 5 committee at its Cedar Point, Ohio, meeting on August 27, had been submitted by letter ballot to the members of the Electrical Committee early in September and that, though all votes had not yet been received, it was probable that the complete vote would show that greater unanimity of opinion on the rules which had been asked by the American Engineering Standards Committee as a preliminary to its approval of the rules as an American standard.

At the same time letter ballots were sent to the members of the executive committee, N. F. P. A., asking a vote on the subject of resubmitting the rules in their compromise form to the A. E. S. C., in place of those approved by the open meeting of the association at its meeting last May.

If the results of both votes are favorable, it was announced by Mr. Small, the rules would go to the A. E. S. C. in time for its October meeting, together with the other changes in the Code made during 1926. This meeting will be an extra-regular one, having been planned for at a meeting in September, when it was seen that a compromise was being reached in the sheathed cable matter.

Favorable action by the A. E. S. C. will make the 1926 change in the Code part of an American standard. There is, however, little likelihood that the National Board of Fire Underwriters will issue a 1926 Code. Probable action, due to the expense of getting out an entirely new Code, will be to list the 1926 changes in a supplement to the 1925 Code.

The compromise rules as agreed upon by Committee on Article 5, follow:

N. E. C. 507—*Non-Metallic Sheathed Cable*

(a) Cable shall not be used for circuits exceeding 300 volts between conductors.

(b) Cable shall not be used except for all circuits in residence occupancies, and in out-buildings on the same premises where other types of wiring are not required by this Code.

(c) Shall be of approved types and of 2 and 3 conductor assemblies in sizes Nos. 14 to 6 inclusive.

(d) May be used in exposed wiring work under the following conditions:

(1) Shall be mounted directly upon surfaces of woodwork, plaster, cement, brick or other building finish.

(2) Shall be secured between outlets with approved fastenings spaced at intervals not exceeding 4 feet.

(3) Shall be used only in dry places, and in no place run along the wall nearer than 6 inches above the floor.

(4) Shall be protected within 5 feet of floor by wood or metal protecting strip placed over the cable and securely fastened.

(e) May be used in concealed wiring work under the following conditions:

(1) Shall be used only in dry places; in wood joist or stud partitions, floors and walls.

(2) When Non-Metallic Sheathed Cable is used for concealed wiring, it shall be secured between outlets by approved fastenings spaced at intervals not exceeding four feet or by other practicable means which will provide for the entire installation being securely fastened in place.

(3) Where it is impracticable in concealed wiring to provide the supports specified in the preceding paragraph, runs of Non-Metallic Sheathed Cable may be fished between the outlet boxes or plates.

(f) Shall be run without joints, splices or taps from outlet box to outlet box, or junction boxes or plates).

(g) Shall be provided with approved outlet (or junction) boxes or plates at each outlet, into which the cable shall be run and to which it shall be rigidly fastened by means of approved fittings, which completely close the opening. If cable enters boxes from the side in concealed work, boxes of 1 1-2 in. depth are required.

Note.—It is recommended that for all side wall and partition outlets in concealed work in new buildings under construction outlet boxes having a depth of approximately 1 1-2 inches be used.

(h) All bends shall be so made and other handling shall be such that the Non-Metallic covering of the cable will not be injured.

(i) Shall not be buried in plaster, cement, or similar finish.

(j) When Non-Metallic Sheathed Cable is installed in conduit the provisions of section 503 of this Article shall apply as far as practicable.

(k) When in exposed or in concealed wiring, Non-Metallic Sheathed Cable is run through holes in studs, joists or similar wood members, the holes shall be located at the approximate center of studs and not less than 2 inches from the nearest edge of joists or other members whose depth permits this spacing.

(l) In attics and roof spaces where within five feet above floor or joists, the cable shall be considered as exposed to mechanical injury, and shall be protected by suitable wood or metal strips securely fastened in place. Cable shall not be used across top or joists in unfinished attics or roof spaces, nor in similar locations.

(m) Cable in basements, if used in other than concealed work, shall be run on under side of running board, not less than 7-8 in. by 2 in., or on side of floor joists or timbers.

A. E. I. Estimating Course for Westchester Contractors

On September 22, sixteen men representing contractors from five cities in Westchester County, N. Y., met for the first lesson in the A. E. I. Estimating Course.

The meetings are being held at Mount Vernon, by Arthur L. Abbott, technical director of the A. E. I.

One feature of the course as developed by Mr. Abbott is a special investigation of any unusual local conditions and the preparation of special estimating data to fit such conditions. In this instance a field for such an investigation was found in residence and apartment house wiring. A large percentage of the residences built in this district range from $18,000 to $100,000 in cost. Several members of the class are keeping the necessary labor cost records on some of their jobs, and the latter part of the course will consist of a discussion of practical estimating methods and data based on these records.

New Jersey Issues Electrical Safety Rules

New rules were made effective September 1 by the New Jersey Labor Department, Bureau of Electrical and Mechanical Equipment, requiring grounding of all portable electrical conveyors, elevators, drills, tools and devices, including portable hand and stand lamps; motors; metal inclosures of compensator switch and other controls, including handles and levers; the bonding of all metal inclosures at or around a motor to the frame; the use of a third wire in chemical plants and where excessive moisture exists; prohibition of balance coils except when employed purely for motor starting; insistence on two-coil transformers for dividing circuits, and limitation of lighting circuits to maximum of 125 volts.

Methods of grounding are set-up very definitely as follows:

"The securing of the ground wire to the portable device shall be accomplished by means of a drilled and tapped hole; by the use of a screw with clip, washer, or lug, thus securely and effectively completing connection between ground wire and frame of device. The grounding of the portable device may be completed by connecting the third terminal of the approved polarity receptacle to a conduit system by means of a drilled and tapped connection. A conduit system shall not be considered as an effective means of grounding unless all conduit boxes and fittings are bonded together by the use of approved clamps or drilled and tapped connections. Connecting bonding wires shall not be smaller than 8 for ½-inch pipe, 6 for ¾-inch pipe, 2 for 1-inch to 1½-inch pipe, and 1/0 for all pipe larger than 1½-inch.

"Flexible conduit and the sheathing of flexible armored cable shall be used for grounding purposes only on branch circuits having a maximum carrying capacity of 25 amperes, and such conduit or cable sheathing shall be bonded to all boxes, fittings and equipment with copper jumpers not less than Number 10 gauge wire and approved bonding devices.

"Final connection to ground is in every case required to be made at the water supply pipe on the street side of meters and at two points with approved fittings."

Denver Working for New Code

Efforts are being made to bring into force the electrical working rules prepared by the electrical interests of Denver and submitted to the city authorities some time ago for their approval. It was expected that the proposed rules would be referred again to the original code committee some time during September, with a few changes recommended by the city authorities.

Manufacturers Consolidate Organizations

Creation of the National Electrical Manufacturers Association, an organization consisting of 270 leading electrical manufacturers with a gross annual business exceeding a billion and a half dollars has been announced following the merging of the Electric Power Club, the Associated Manufacturers of Electrical Supplies, and the Electrical Manufacturers Council.

Gerard Swope, President of the General Electric Company, was elected president of the new association at the first meeting of the Board of Governors, and J. W. Perry, Vice-President of the Johns-Manville, Inc., was made treasurer.

The association as now organized has three divisions: policies, apparatus and supply. At their first meeting the Board endorsed the proposal to give the radio section the status of a division.

A Board of 30 Governors was elected at the first meeting of the National Electrical Manufacturers Association, as follows: Policies Division, C. L. Collens, Reliance Electric and Engineering Co., of Cleveland; vice-president, David Sarnoff, Radio Corporation of America, New York City; J. H. Trumbull, Trumbull Electric Mfg. Co., of Plainville, Conn.; Fay Woodmansee, Electrical Engineers Equipment Co., of Chicago, Ill.; H. B. Crouse, Crouse-Hinds Co., of Syracuse, N. Y.; O. H. Falk, Allis Chalmers Mfg. Co., of Milwaukee, Wis.; F. S. Hunting, Robbins & Myers Co., of Springfield, Ohio; E. M. Herr, Westinghouse Electric & Mfg. Co., of New York City; Gerard Swope, General Electric Co., of New York City; and W. H. Thornley, Tubular Woven Fabric Co., of Providence, R. I.

J. M. Curtin, Westinghouse Electric and Mfg. Co., of East Pittsburgh, Pa., is vice-president of the Apparatus Division. Other governors of the Apparatus Division are Louis Allis, the Louis Allis Co., of Milwaukee, Wis.; R. H. Goodwillie, Otis Elevator Co., of Yonkers, N. Y.; H. W. Young, Delta-Star Electric Co., of Chicago; T. E. Barnum, Cutler-Hammer Mfg. Co., of Milwaukee, Wis.; H. C. Petty, Crocker-Wheeler Electric Mfg. Co., of Ampere, N. J.; A. H. Timmerman, Wagner Electric Corporation, of St. Louis, Mo.; C. H. Strawbridge, Goodman Mfg. Co., of Chicago; M. O. Troy, General Electric Co., of Schenectady, N. Y. and N. A. Wolcott, Packard Electric Co., of Warren, Ohio.

D. H. Murphy, Wiremold Co., of Hartford, Conn., is vice-president of the Supply Division. Other governors of the Supply Division are: J. W. Perry, Johns-Manville, Inc., of New York; M. C. Rypinski, Brandes Products Corporation, of New York; J. P. Wright, Continental Fibre Co., of Newark, Del.; C. A. Bates, Bryant Electric Co., of Bridgeport, Conn.; B. B. Dinsmore, Imperial Porcelain Works, of Trenton, N. J.; J. F. Kerlin, National Carbon Co., of Cleveland, Ohio; D. R. G. Palmer, Safety Cable Company, of New York; D. R. Bullen, General Electric Co., of Schenectady, N. Y. and S. L. Nicholson, Westinghouse Electric & Mfg. Co., of New York.

California Electragists Preparing for Del Monte

A two-day annual convention of the California Electragists gets under way on October 1-2 at Del Monte, as this issue goes to press, with the advance program indicating that the high spots of the meeting will be the discussion of the activities of the various sections of the organization and a talk at the final session by Joseph A. Fowler, president

of the Association of Electragists, International.

During the past year the state association has been particularly active in the conduct of such sections as the Merchandising Section, Estimating Section, Motor Section and Accounting Section and the reports of the accomplishments of these sections were scheduled to be made during the meeting.

Other important features included a talk on "Illumination Design for the Electragist," by Clark Baker, a joint meeting of the division executive committees, an address by Charles T. Hutchinson, the talk of Mr. Fowler, an address on the "Progress of the Electragists and the Value of the Organization to the Industry," and an address by A. E. Wishon.

Sanborn Opens in Long Island

G. A. Sanborn, a past president of the Association of Electragists, International, and president of the Sanborn Electric Company, Indianapolis, Ind., has formed a new company known as the Sanborn Electric Company of Montauk, Inc., with offices at Montauk, L. I., N. Y. The officers are G. A. Sanborn, president; W. H. Morton, treasurer, and O. F. Wadleigh, secretary. W. E. Drake will be resident manager.

This new company will take an important part in the new Montauk development started by Carl Fisher, who was largely responsible for the Miami, Fla., development.

Pennsylvania Association to Meet On October 4

Announcement has been made that the fourteenth semi-annual convention of the Pennsylvania State Association of Electrical Contractors and Dealers will be held at the New Elks Hotel, Philadelphia, on October 4, 5 and 6.

The outstanding feature of the meeting will take place on the evening of the first day, when there will be held a jobber-manufacturer-contractor open forum for the discussion of the A. E. I. trade policy. Mr. Hallstrom of the Western Electric Company is slated to preside at this session, with the opening address to come from Laurence W. Davis, general manager, A. E. I.

E. M. Herr, president, Westinghouse Electric and Manufacturing Company, will be the principal speaker at the banquet.

City Electricians Oppose Wide Code Divergencies

Wide divergencies between local electrical wiring codes in neighboring jurisdictions are opposed in a resolution adopted by the International Association of Municipal Electricians at their annual convention at Asheville, N. C., on September 23. The resolution also approved of the efforts now being made to write into the Code "where" materials and types of wiring may be installed.

Both of these points have come to the consideration of the industry largely through the efforts of Electrical Field Secretary, W. J. Canada, whose services the municipal electricians voted to avail themselves of whenever practicable.

While the electragist wiring specifications program of the A. E. I. is not specifically mentioned by the resolution, the preamble of the motion makes note of the fortunate growth of movements aimed at the development of interior wiring standards along lines of permanence, adequacy and efficiency.

The resolution passed at the convention reads as follows:

"WHEREAS, Members of the International Association of Municipal Electricians who are to an exceedingly large degree responsible for properly insuring the electrical safety and welfare of the citizens of their various municipalities observe the recent fortunate growth of cooperative agencies and movements aimed at the necessary development of interior wiring standards, along lines which will promote safety, convenience, economy, adequacy and permanence of wiring installations and their suitability for particular circumstances of building construction, occupancy and likelihood of change and,

"WHEREAS, This association desires to assist constructively every such agency and movement in its fact finding, consideration of facts and conclusions as expressed in the standard under development and,

"WHEREAS, This association by long experience has learned that the best results in economy and safety are not secured by wide divergencies between the wiring standards applying in neighboring jurisdictions, whether these be in conflict with a single national standard or in the way of additions thereto or of mixed character,

"THEREFORE, BE IT RESOLVED, That this association hereby directs the code subcommittee of its standardization committee to immediately proceed with the following program:

"(1) To ascertain from each member local wiring practices, whether written or unwritten, which differ from the national electrical code whether as additions or changes.

"(2) To study, compare and select from such changed practices those which in the judgment of the committee are suitable and timely for inclusion in the national standard as supported by this association.

"(3) To reject and support local rejection of such rulings as in the judgment of the committee are not valid for use as additions to or changes from national standards.

"(4) To present these findings to the association as made and to present them also to various cooperating agencies as made.

"(5) To utilize in these connections the services of the electrical field secretary of the National Fire Protection Association as is found practicable.

"(6) To correlate this program with the association's representation on the electrical committee, N. F. P. A. by having its representative on the electrical committee always a member of its code subcommittee."

North Carolina Forms Construction Industry Alliance

Several hundred architects, engineers, contractors, sub-contractors, materialmen, and dealers attended a convention held in Charlotte Sept. 7, 8 and 9, and one of the outstanding developments of the convention was the formation of a permanent organization of the various building and allied trades which is to be known as the Allied Construction Industry. This is an original step in the matter of closer cooperation between all of the industries interested in the building profession and the objects of this organization are to coordinate all branches of the profession, thereby eliminating waste, promoting a better class of construction on an ethical plane and as a result a saving to the public.

The following officers were elected for the ensuing year: H. E. Longely, president, Wilmington; R. H. Bouligny, vice-president, Charlotte; F. G. Bradley, secretary, Charlotte; J. D. Wilkins, treasurer, Greensboro.

Mr. Bouligny is president of the North Carolina Association of Electricians.

Camp Cooperation Delegates at Their Fifth Annual Meeting at Association Island, N. Y.

Camp Cooperation VI Discusses Market Development, Red Seal and Uniform Ordinance

Reports Show Satisfactory Progress of Red Seal Plan—Cooperation of Local Leagues Asked in Pushing Uniform Ordinance Activity

THOUGH the high spot in the proceedings of Camp Cooperation VI at Association Island, Henderson Harbor, N. Y., September 4-7, was the disclosure of a plan for cooperative development of the electrical market (see page 29), both the Red Seal plan and the need for the uniform wiring ordinance found important places on the program.

H. B. Kirkland, in charge of the wiring division of the S. E. D., opened the discussion of the Red Seal plan and its place in industry by a brief picture of what the society is doing to advance in common cause the many factors in the industry which have to do with better and more adequate wiring practice.

S. L. Nicholson, representing the National Electrical Manufacturers' Association, presented a brief statement of the uniform electrical ordinance which is sponsored by that organization and asked for the cooperation of electric leagues in taking the initiative to see that any local ordinance development was kept on the track by intelligent understanding of the reason for a uniform ordinance.

Following Mr. Nicholson, W. J. Canada, who represents in the field the National Fire Protection Association in their work of promoting the electrical code, emphasized the community of interest between the establishment of the local ordinance, the Red Seal Plan and the forwarding of better wiring practice in the industry.

At the concluding business session on Saturday morning a paper by George W. Bakewell, Jr., executive manager of the Electrical League of Colorado, on "Wiring Installations in Other Than Residence Construction" was abstracted by K. A. McIntyre. It aroused a considerable discussion particularly from the viewpoint of how far leagues might go in laying out wiring plans for large work which involved electrical engineers, architect and the general contractor.

News Notes Concerning Contractor-Dealers

The Norwalks' Electric Company, South Norwalk, Conn., has been incorporated under the name of the Norwalk Electric Company, with the former proprietor, Ray Werme, as president, treasurer and manager.

George H. McKee, operating as George H. McKee, Inc., Mount Vernon, N. Y., has purchased the business of Kummerle & McKee of that city and will continue under the new name the construction department of the former company.

The partnership of Harold Witham and John Yerrick in the Hudson Electric Company, Hudson, N. Y., has been dissolved. The business will be continued by Mr. Yerrick. Mr. Witham plans to engage in the electrical construction business in Great Barrington, Mass.

New Electragists

The following contractor-dealers have made application for membership and been accepted into the A. E. I. since the publication of the last list in the September issue:

CALIFORNIA

Vallejo:
Rhodes Elec. Co.

ILLINOIS

Chicago:
J. Trier & Co.

MARYLAND

Baltimore:
Charles E. Chalmers
Hanover Elec. Co.
John F. Heath
Statter Elec. Co.

MINNESOTA

Blue Earth:
Wares Elec. Co.

NEBRASKA

Lincoln:
Gerstenberger Electric

NEW YORK

Syracuse:
Syracuse Elec. League, Inc.

White Plains:
Whiffen Elec. Co., Inc.

OHIO

Cardington:
Holt Elec. Co.

Columbus:
The Central Ohio Elec. Co.
Emswiler Elec. Equipment

Lima:
The Sweeney Elec. Co.

PENNSYLVANIA

Pittsburgh:
Call Us Elec. Co.
Davidson Elec. Co.
Delmer Elec. Co.

TENNESSEE

Memphis:
Thompson Elec. Co.

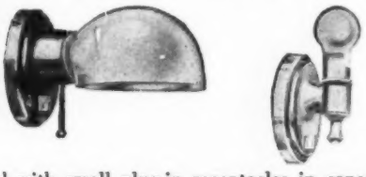
WISCONSIN

Madison:
Robert J. Nickles

News of the Manufacturers

"Aglite" Units

Two new units have been added to the "Aglite" fixture line, manufactured by the Edwin F. Guth Company, St. Louis. They are a bracket type with a glass shade and a candle bracket type. In the former the canopy is oval shaped, permitting installation in narrow spaces and it is made in keyless and pull chain types. Either type may be



had with small plug-in receptacles in canopy.

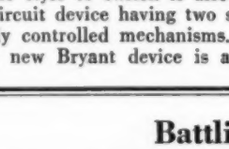
The candle bracket also has an oval canopy and a small convenience outlet if desired. It has a glazed porcelain toggle switch with enameled fiber screw caps.

The units have the regular "Aglite" finish.

"Trigle" Switch

The Bryant Electric Company, Bridgeport, Conn., is making a new tumbler device having three single pole individually controlled switch mechanisms with common feed mounted in one porcelain cup. It has three indicating black composition handles centered vertically on a standard single gang flush plate.

This device is known as a "Trigle" No. 2,860 switch and can be used as a three-circuit electrolier switch or for controlling three separate circuits with common feed.

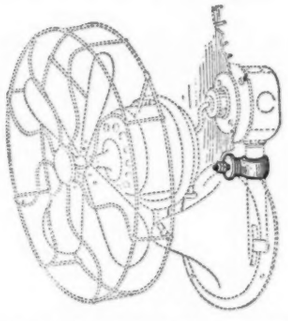


The same style of switch is also furnished as a two-circuit device having two single pole individually controlled mechanisms.

Another new Bryant device is a combination flush receptacle and double pole tumbler switch with plate. Some of the advantages claimed for it are: The receptacle and switch combination is a complete device in itself, the plate is separate and the switch handle does not interfere with the attachment plug cap when in the outlet; the handle is indicating; it fits in a one gang box and the device can be installed so that the switch will control the plug outlet, or so that the plug outlet is always in circuit.

"Latrobe" Products

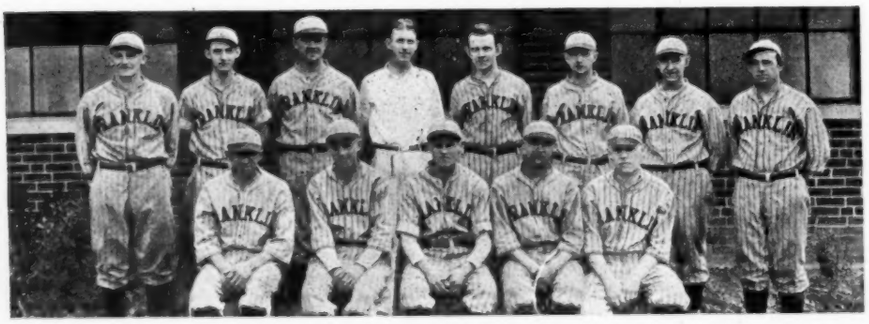
A new fan hanger, illustrated below, has been announced by the Fullman Manufacturing Company, Latrobe, Pa. The feature of the new device is that it anchors the fan to the conduit and not to the outlet box so that there is no strain on small cover screws which are apt to pull out or loosen with vibration.



Its use also makes it possible to employ any standard combination of outlet boxes, covers, receptacles and brass cover plates. The fan hanger may also be used for hanging electric clocks, radiant heaters, illuminated pictures, etc.

The company is also marketing a new conduit bender which is provided with a movable jaw. This is reversible for bending both ½-in. and ¾-in. conduit. The jaw may be replaced at slight cost if it wears smooth after a year or two of service.

Battling for the Pennant

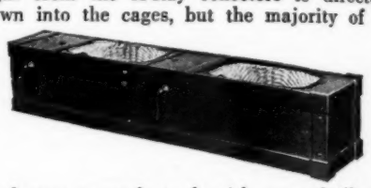


The above husky ball-tossers, representing the Franklin Pottery, Lansdale, Pa., were in the runner-up position in the Industrial League of their home town, at the time of writing. But their aim is one rung higher in the percentage column and predictions are flying about freely that their next group picture will show the prized gonfalon

Bank Ray

A new type of light for banks is provided by a new design of "X-Ray Bank Ray," recently announced by Curtis Lighting Inc. The "Bank-Ray" consists of small but powerful silvered glass X-Ray reflectors concealed in an ornamental housing located at and fastened to the tops of the bank cage cornices and finished in such a way that it appears to be the coping of the grill itself.

For direct-indirect lighting, a portion of the light from the X-Ray reflectors is directed down into the cages, but the majority of it



is thrown upwards to furnish general illumination for the bank. In this case, both top and bottom of the Bank-Ray are open, some light passing through a glass diffuser in the bottom of the reflector and down upon the cage counter, the remaining light being directed upwards upon the walls and ceiling.

Where only the bank cage counters are to be illuminated, the top remains housed and all the light is thrown downwards.

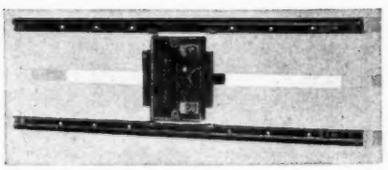
For totally indirect lighting, the bottom is closed and all the light is thrown upwards.

Lighting Equipment

A complete new line of lighting equipment, created by the Beardslee Chandelier Manufacturing Company, Chicago, has just been put on the market and the company is now distributing a catalogue describing the line, which will be known as the "Niello" line. The catalogue shows the fixtures in their natural colors, a combination of natural copper and iron, with incised designs filled with colored enamels. The new designs give the fixtures a medieval touch particularly well suited to the period architecture now the vogue among home builders and the use of the natural metals insures the long life of the finish. They are designed so that they may be used with silk, parchment or glass shades.

Switch Boxes

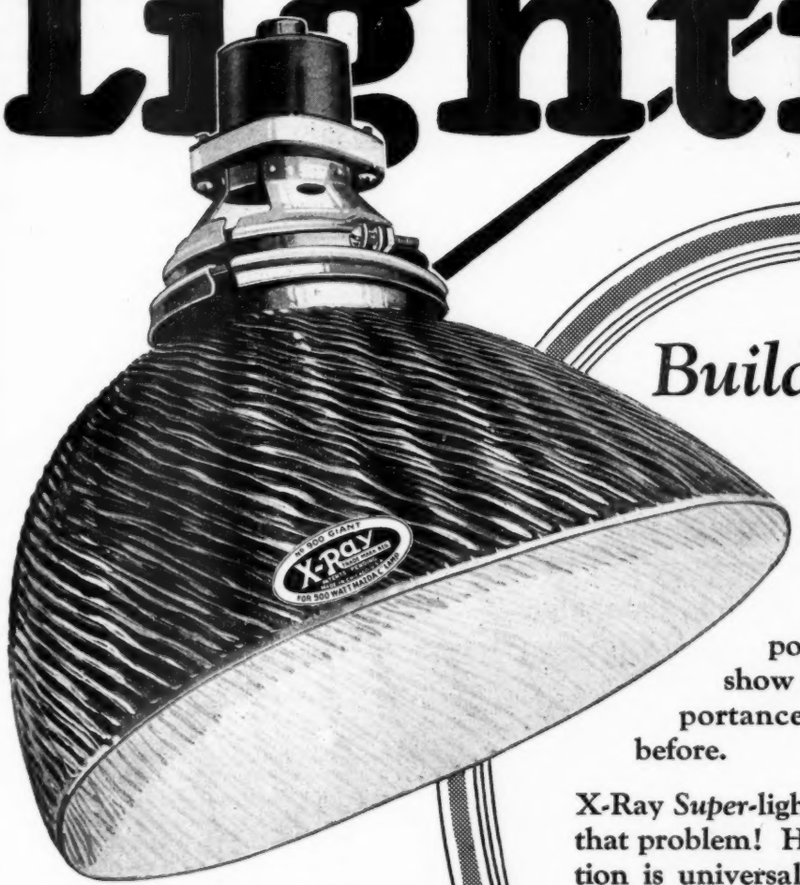
The Chicago Fuse Manufacturing Company has brought out new large four-inch switch and receptacle boxes in both the "Gem Locktite" and "Gem Bracket" types. These larger boxes provide greater amount of wiring space and because of this can also be used for wall bracket outlets.



"Locktite" has the same steel supporting bars as the standard boxes and is provided with knockouts for loom, sheathed cable, flex-

X-Ray Super Lighting

TRADE MARK REG.



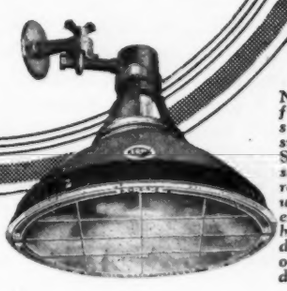
Above is the X-Ray No. 900 Giant Reflector. This powerful unit is designed for use with the most efficient 500 or 300-watt Mazda lamp. The Giant is for use in large deep windows with high trim, while its partner, the Leviathan No. 910, is for use in large shallow windows. Mogul sockets are included with both.

Builds Sales!

One of the biggest factors in retail selling today is the display window. The problem of creating more sales through the pulling-power of the well-lighted show window is of vital importance now more than ever before.

X-Ray *Super*-lighting is the solution of that problem! High-intensity illumination is universally accepted in display circles as a forceful way to put across the sales message in the show window.

Merchants need and want SUPER-lighting—help them get it!



The Hippo No. 88 Window floodlight shown above, supplements the Super-lighting show window reflectors. This unit is used to emphasize with high-lights any definite object or group in a display.

CURTIS LIGHTING, Inc.
1119 West Jackson Boulevard
CHICAGO

31 West Forty-Sixth Street, New York

3113 West Sixth Street, Los Angeles

ible and rigid conduit and has provided for fixture stud in bottom. They may be installed either perpendicularly or horizontally. Catalog NT boxes are provided with new wide clamps.

The bracket boxes are similar. The bracket attachment makes the use of mounting bars unnecessary. The ears in both these boxes are turned in so that the center distance between the drilled and tapped holes is the same as for standard boxes and all switch and receptacle plates may be used.

Flexible Steel Conduit

The American Metal Moulding Company is now making and stocking at its Irvington, N. J., factory a 3-in. flexible steel conduit. The company is prepared to make deliveries of this material immediately.

Manufacturing Notes

Harry S. Schott has been appointed general sales manager of the National Carbon Company, Inc., with offices in New York. He has been assistant general sales manager of the company since 1924.

Two new district representatives have been appointed by the Fullman Manufacturing Company, Latrobe, Pa., as follows: Leigh A. Doxsee Company, 1911 Pine Street, St. Louis, for the State of Missouri, and Arthur E. Bacon, 1429 Eighteenth Street, Denver, for the State of Colorado.

George Richards & Co., Chicago, manufacturers of "Hemco" plugs, have announced an intensive merchandising campaign for this fall. It centers around a metal display stand, mounting the company's line of plugs, and stresses the importance of giving the display stand a prominent place on counter or in window in order to boost appliance sales. The campaign will be tied in with trade-journal and national-magazine advertising.

Planning More and Better Business

Above are sixteen reasons why the Tubular Woven Fabric Company, Pawtucket, R. I., expects more and better business to result from the company's recent sales conference at its home office. The salesmen shown, left to right, are: Back row, Jack Johnson, Ben Carter, Em Smith, Ernie Stream, Joe Kennedy, Bill Whittaker, Ernie Alcott, Ralph Mount, Gray Jones, Len Kingsley; front row, Fred Brower, F. M. MacDuffie, W. E. Sprackling, vice president, H. N. Otis, secretary, Russ Wherritt and Bill Collins

J. H. Rohs, formerly with the Mutual Electric and Machine Company, has been appointed eastern representative of the Hub Electric Company of Chicago. He will have offices in New York City.

Frank P. Withers, formerly service engineer for the Line Material Company, South Milwaukee, Wis., has become associated with the Illinois Electric Porcelain Company, Macomb, Ill., in the capacity of electrical engineer. He will be in charge of the company's Chicago office at 608 South Dearborn Street.

The Circle F Manufacturing Company, Trenton, N. J., has announced the appointment of B. H. Clifford, 3201 Twelfth Avenue, N., Birmingham, Ala., to handle its line of wiring devices in the States of Arkansas, Alabama, Mississippi, Louisiana and Tennessee west of Nashville.

New and more commodious quarters have been leased for the G-Q Electric Company at 208-220 Broadway, Milwaukee, Wis., and the removal of the company's offices and warehouse to the new location was completed during September.

Catalogue No. 22, illustrating and describing its complete line of wiring devices, has been issued by the Arrow Electric Company, Hartford, Conn.

Kenneth Curtis, chairman of the board of control of Curtis Lighting, Inc., as well as several other executives of the concern, has just finished a series of fifteen radio talks broadcast weekly over Station WQJ, Chicago. Recent phases of indirect lighting for homes, schools, churches, theaters, banks and hotels were discussed.

The Steel City Electric Company, Pittsburgh, is building additions to its factory, which will add 30,000 square feet of floor space to its facilities.

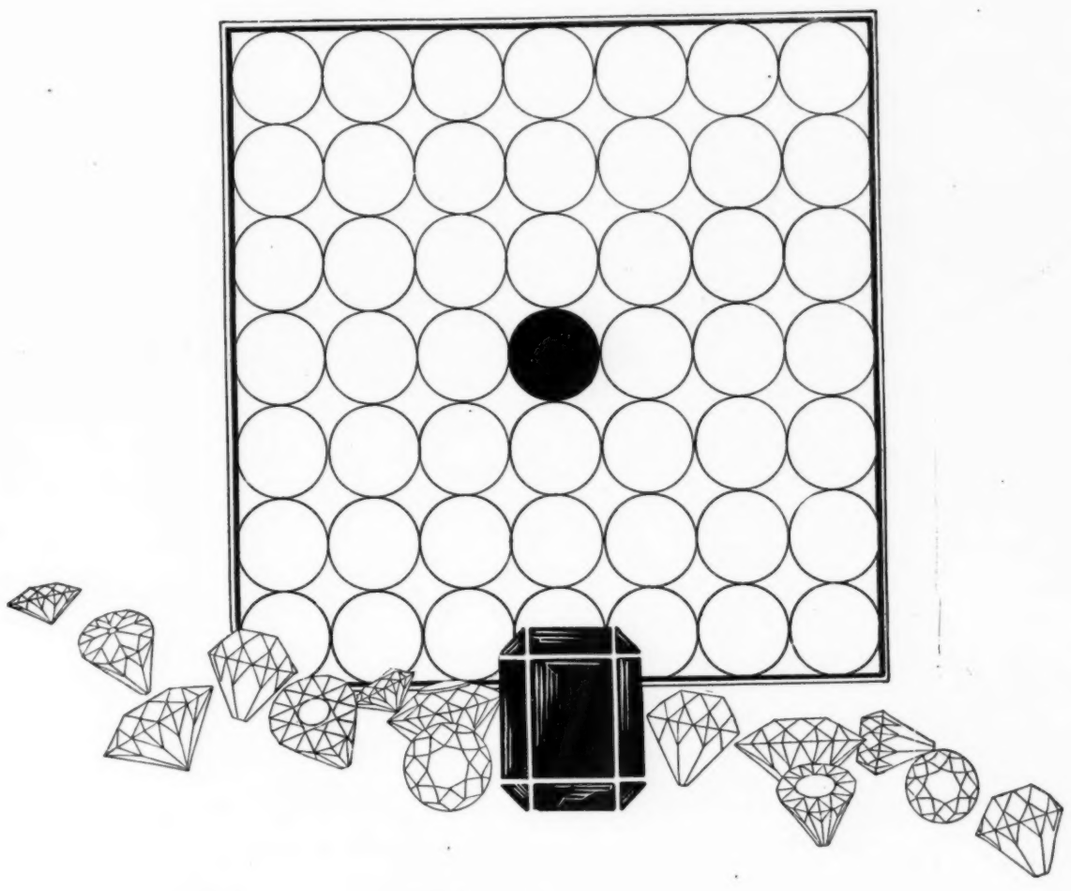
Instructions for planning industrial lighting installations, together with a worked-out typical problem, are explained in the first pages of the new catalogue on industrial lighting equipment just released by the Westinghouse Electric and Manufacturing Company.

Announcement is made by the New York executive offices of the Graybar Electric Company of change in management of its Providence and Grand Rapids distributing branches. A. Schwenck, formerly sales manager at Grand Rapids, will assume the managership of the Providence branch, while Frank Caestecker of the Chicago branch will go to Grand Rapids.

The Veco Manufacturing Company, South Norwalk, Conn., has recently published its Catalogue No. 5, describing and illustrating its complete line of aluminum conduit fittings.

Hemco Announces Merchandising Campaign

An announcement of much interest to the trade was made at the sales convention of George Richards & Co., Bridgeport, Conn., held during August. It was that "Hemco" products will be aggressively merchandised to the public through dealer sales helps and national advertising. The men attending the convention are shown above. They are, left to right: Top row, W. L. Geuder and O. Pfannkuch; second row, L. W. Drew, general manager, George J. Kirkgasser & Co.; C. W. Muench and W. F. Beck; third row, M. Edds, H. V. Lips and J. R. McGinnis; fourth row, L. B. George, B. P. McKinley, J. P. Randall, R. J. Hansman, J. G. Engler and J. F. Lamar; front row, J. A. Conroy, C. J. Grandy, M. A. Tierney, L. R. Keller, H. E. Colliver, George C. Richards, H. V. Flora and J. B. Behan.



Black onyx among diamonds

BLACK onyx among diamonds catches the eye instantly—and so does a blown fuse in a D. & W. equipped circuit. That's because the normally white circle in the fuse center turns black when the fuse blows. You can depend on D. & W. fuses, gauged and inspected at every step in manufacture, to carry their ratings, and to function with accuracy. Call on Graybar for complete supplies.

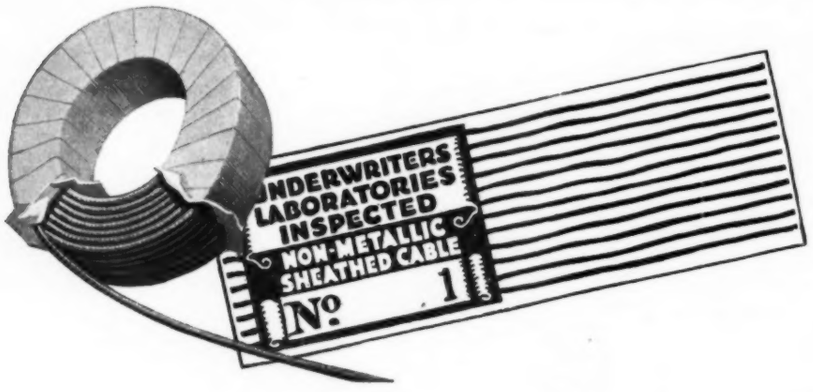
For twenty-five years the D. & W. label on a fuse has been a hall mark of quality.

GraybaR

ELECTRICAL SUPPLIES

Successor to *Western Electric* Supply Dept.

Offices in 53 Principal Cities. *Executive Offices 100 East 42nd St., New York.*



ROMEX is SAFER

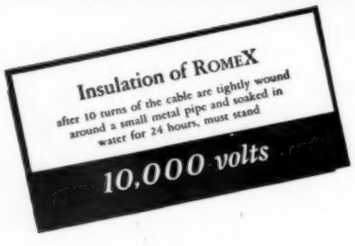
THE rust promoting moisture which gathers in floors or partitions of all buildings in all climates does not affect the protective finishes of ROMEX Cable.

ROMEX is saturated with greatly improved forms of the compounds which have preserved and protected wire sheathings for more than a decade in countless damp locations where metal encased systems have repeatedly failed.

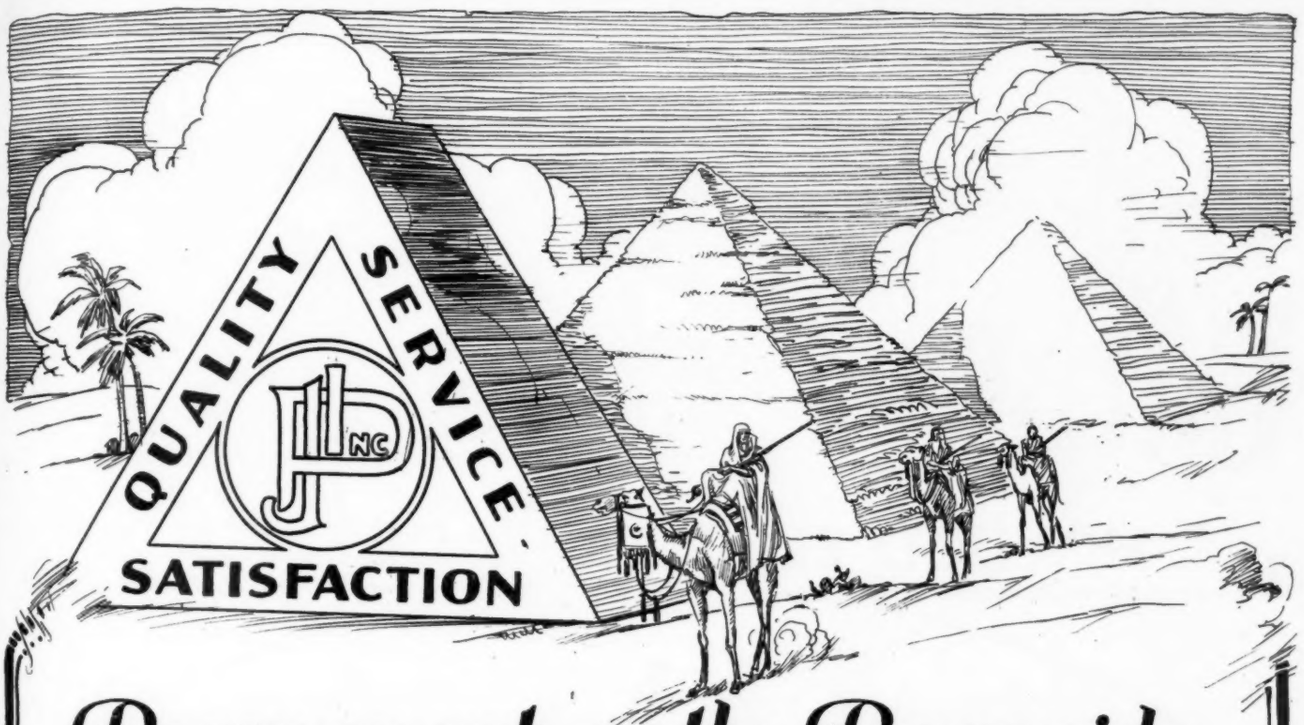
Moisture, gas fumes and other corrosive agents which destroy the safety factor of the all-metal job make no impression upon the enduring safety of ROMEX — the original Non-Metallic Sheathed Cable.

ROME WIRE COMPANY, ROME, N.Y.

ROMEX
NON-METALLIC SHEATHED CABLE


Insulation of ROMEX
after 10 turns of the cable are tightly wound around a small metal pipe and soaked in water for 24 hours, must stand
10,000 volts

Genuine ROMEX is identified by its Blue Mica Finish and patented double sheathed kraft tape construction



Permanent as the Pyramids

No. 3400 Keyless Socket

No. 50715 Receptacle

Quality, Service and Satisfaction are the three planks in the Paulding platform—the firm foundation for the well-known Paulding Trade Mark.

These three qualities are an inseparable part of Paulding Products and Policies; they represent our way of doing business—a plan that *is* "Permanent as the Pyramids."

This permanence is the contractors' guarantee of goodness—his insurance that every Paulding Wiring Device is right, or will be made right.

"Wiring with Paulding" means building for the future as well as the present—putting in the kind of jobs that give permanent satisfaction and that build a permanent reputation for the man who did the work.

John I. Paulding, Inc.
New Bedford, Mass.

PAULDING
WIRING DEVICES OF MERIT

Gather in Fall Profits! with REYNOLITE

TRADE MARK REG. U.S. PAT. OFF.

MOLDED ELECTRICAL DEVICES

Know more about these popular devices *Write us*

REYNOLITE now standard of comparison *Write us*

Reynolite is always supporting your sales efforts with consistent missionary work—Advertising—Direct Dealer Mailings—Sample Cases—Original Counter Display Salesmen — Five-Piece Window Trims — Fliers — Quality — Price — Profit — Publicity—Service—and a

RESTRICTED JOBBERS POLICY

(If not receiving REYNOLITE *Sales Helps write today)*

REYNOLITE Division

TRADE MARK REG. U.S. PAT. OFF.

REYNOLDS SPRING COMPANY
JACKSON, MICHIGAN

NEW YORK
A. R. Macy

PHILADELPHIA
C. N. Wiltbank

PITTSBURGH
H. B. Parke

DETROIT
H. M. Hemphill

CHICAGO
E. F. Meyers

KANSAS CITY
O. T. Jenkins

DALLAS
E. T. Gunther

LOS ANGELES
J. T. Hill

ATLANTA—Fulwiler & Chapman

AMERICAN

-forging to the front as the best in-

Armored Cable

"AMERICAN!" Contractors and Jobbers all over the country are calling it the "best armored cable there is."

"American's" popularity with the men who sell armored cable and the fellows who install it, is due to its QUALITY CONSTRUCTION—backed by facilities for giving service that counts.

With two modern factories producing "AMERICAN" and with leading jobbers everywhere stocking it, it is often a matter of minutes to get it (any size and quantity) into the contractors' hands.

Our jobbers are playing a leading part in "American's" rising popularity; they know the kind of cooperation that the contractor needs—and they make sure that he gets it.

We guarantee the jobber (and the user) that properly made fittings will always fit "American" Armored Cable.

"American" Protective Covering for Non-metallic Armored Cable. Gives necessary protection to the exposed fabric of the new sheathed conductors. Needed by every contractor who uses this type of material. Ask your jobber or write us.

American Metal Moulding Co.

IRVINGTON, N. J. CHICAGO, ILL.

Switches & Service

A few words from—

WADSWORTH

A SAFETY SWITCH is made to give good service and WADSWORTH SWITCHES will do that—as hundreds of contractors who install them will tell you.

And a *switch organization* should give good service, too—and that's another thing that you can count on from Wadsworth.

We have built up an organization of *switch specialists*—men who "know their stuff" and are ready and willing to work with the contractor.

Wadsworth men, located in key cities (see list below), put their technical knowledge at your service; they can help you lay out an installation, select the right type of equipment and do anything else that's necessary to land the job; they work with you and for you. Call them, or write us.

Wadsworth Meter Service and Industrial Type Safety Switches give you the *complete line,* of unquestioned quality and at the right price. And Wadsworth men, covering the country, give you the kind of help that *counts.* That's our idea of **Service.**

Wadsworth Electric Mfg. Co.

Covington, Kentucky

NEW YORK
DETROIT
INDIANAPOLIS

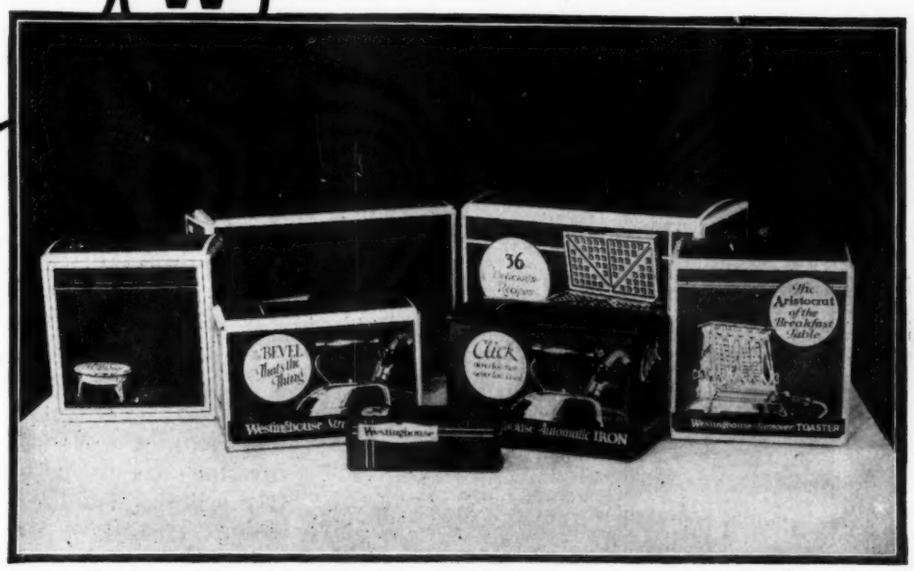
SAN ANTONIO
BOSTON
CHICAGO

DENVER
PITTSBURGH

ST. LOUIS
BIRMINGHAM
ST. PAUL

CLEVELAND
KANSAS CITY
TAMPA

Christmas
--just around the corner



GOODS WELL DISPLAYED ARE HALF SOLD

ON your shelves when Christmas time comes, these Westinghouse appliance packages brighten up your store, add their colorful appeal to the shining appearance of the appliances themselves. Every package is an advertisement in itself, giving a sales message for the appliance inside.

Christmas is just around the corner. A Westinghouse advertising campaign is ready for you—folders, newspaper ads, window and counter cards—all making it easy for you to sell electrical gifts this year.

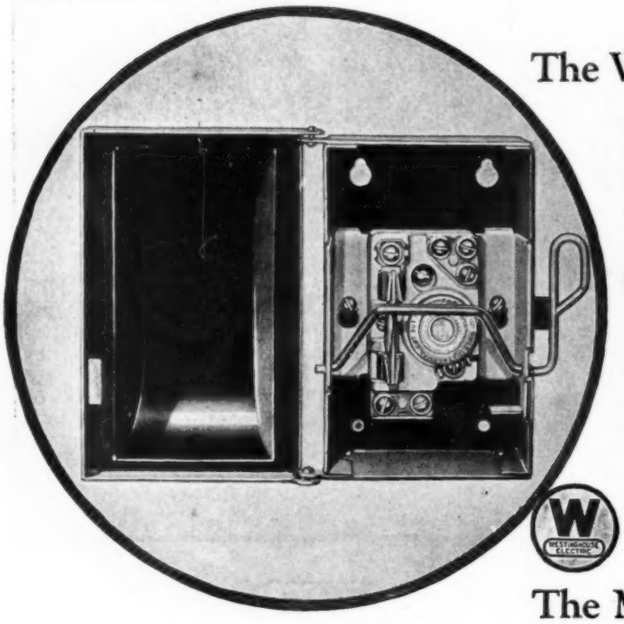
When you plan for Christmas, plan for Westinghouse appliances, nationally known and nationally liked. Your planning will pay.

Westinghouse Electric & Manufacturing Company
Merchandising Department Mansfield, Ohio

Westinghouse

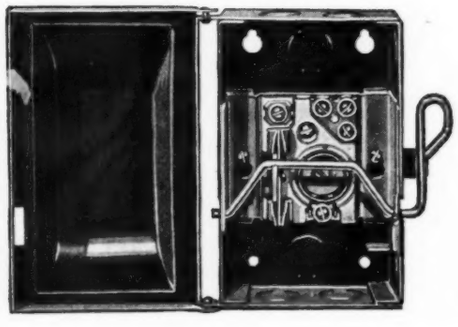
Just Out -- New!

3 Safety Switches You Need For Small Jobs ---



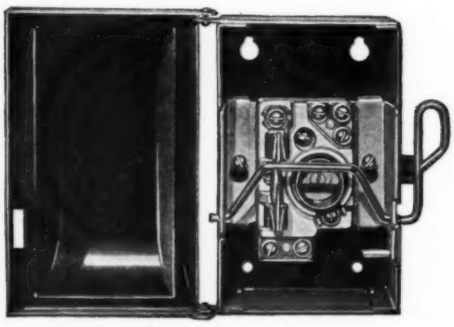
The WK 11 Midget Motor Starting Switch

Something new! A motor starting switch for motors up to ¼ horsepower—with a thermal cutout that gives overload protection while the motor is starting and running. Install this switch and save your customers the expense and trouble of burned out motors. It's a one blade, one cutout starter, and carries the label of the National Board of Underwriters. It's the most inexpensive switch on the market today. You'll find it easy to wire; the switch unit can be taken out of the box without removing the mounting screws. Loosen these two screws and the unit slides right out. It's easy to install.



The Midget Disconnect Switch

A switch you can sell for heavy duty lighting circuits, for heating devices, or as a starting switch for motors up to ¼ horsepower. It's the easiest switch to wire and assemble. The unit can be taken out and put in the box without removing the mounting screws. A single blade, single fused switch, for two wire, 125 volt circuits up to 30 amperes.



The Midget Switch (Refrigeration)

An ideal switch for refrigeration machines or similar household devices thermostatically controlled. The switch is exactly the same as the disconnect switch, but is equipped with terminals for the thermostat leads.

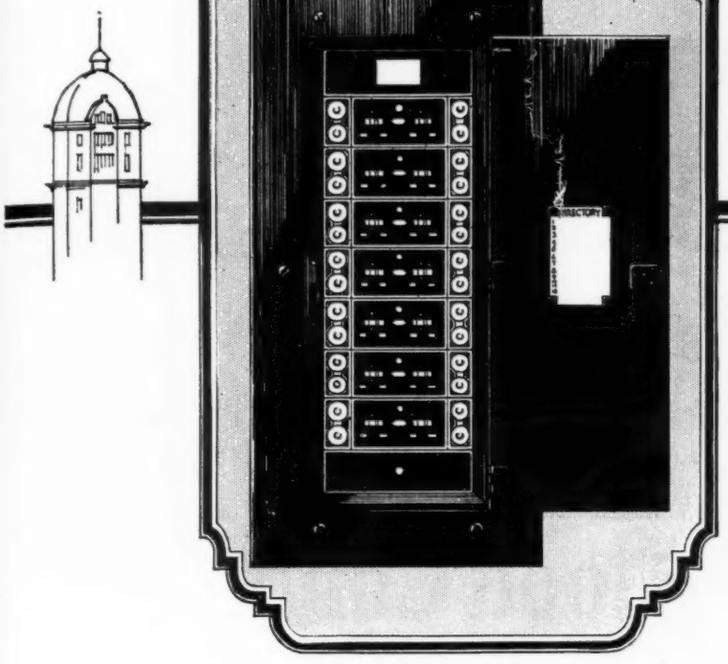
Write for Folder M-443 dealing with these switches.

Westinghouse Electric & Manufacturing Company
Merchandising Department Mansfield, Ohio

Westinghouse

X90055

Westinghouse PANEL BOARDS



Types JT and NJT.

For Residences, Stores and Apartments

For General Lighting Applications

For Industrial and Heavy Duty Service

TYPE R and NR. A safety type panelboard for residences, stores and apartments—simply constructed and pleasing in appearance. The panel unit is removable from the box, making it possible to install the box first and then insert the panel after the plastering is completed.

Type JT and NJT. A full safety panelboard for general lighting applications. Adjustable corner irons and indicating trim clamps permit alignment of the trim when the box is set out of plumb.

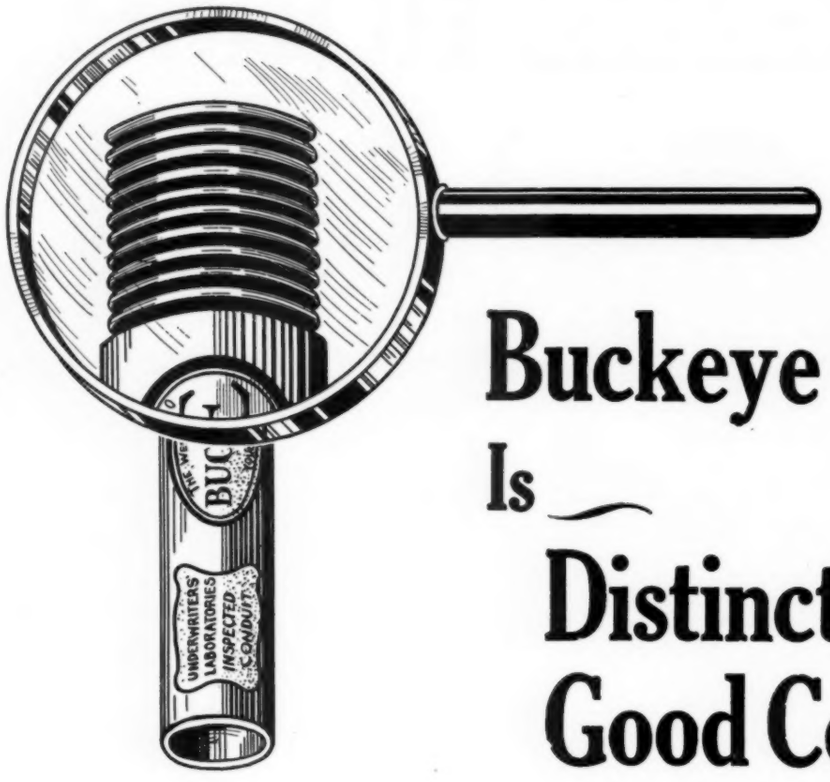
Type T and NT. A full safety panelboard for heavy duty service in industrial plants, railroad shops and the like. Adjustable corner irons and trim clamps as in the JT and NJT. A door-in-door trim and individual switch construction make this panelboard ideal for heavy duty service.

Write for complete specifications on these easy to install panelboards and specify them for your next jobs.

Westinghouse Electric & Manufacturing Company
Merchandising Department, 160 Seventh Street
Panelboard Section, Brooklyn, New York

WRITE FOR OUR NEW PANELBOARD CATALOG

X90053



Buckeye Conduit Is Distinctively Good Conduit

IF YOU remove the Thread Protector that comes on BUCKEYE and look at the threads through a magnifying glass, you will find one of the reasons for the popularity of this Conduit—the most extensively used in the world.

The threads are cut with extreme care and each one is carefully inspected. We can point to jobs of which 65 miles of BUCKEYE was used without a single defective thread, or a single split weld, for that matter.

Made of the finest pipe we can select from the output of the largest independent tube mills in the country, and finished with super care at every step, BUCKEYE is unrivalled in dependability, ductility and the economy with which it is installed.

It can be had from reliable jobbers in all the important cities and towns of this country.

THE YOUNGSTOWN SHEET & TUBE CO.

YOUNGSTOWN, OHIO

DISTRICT SALES OFFICES:

Atlanta—Healey Bldg.
Boston—Massachusetts Trust Bldg.
Buffalo—Liberty Bank Bldg.
Cincinnati—Union Trust Bldg.
Chicago—Conway Bldg.
Cleveland—Union Trust Bldg.
Dallas—Magnolia Bldg.
Denver—First National Bank Bldg.
Detroit—First National Bank Bldg.
Kansas City, Mo.—Commerce Bldg.
Minneapolis—Andrus Bldg.
New Orleans—Audubon Bldg.
New York—30 Church St., Hudson Terminal Bldg.
Philadelphia—Franklin Trust Bldg.
Pittsburgh—Oliver Bldg.
San Francisco—Sharon Bldg.
Seattle—Central Bldg.
St. Louis—Mo. State Life Bldg.
Youngstown—Stambaugh Bldg.

London Representative—The Youngstown Steel Products Co., 316-17 Dashwood House, Old Broad Street, London, E. C. England.

"Hot and Cold—running electricity"

"ALL modern improvements" may mean anything. But when it includes adequate electric wiring it means just what it says.

Electricity, made quickly available by plenty of outlets, cools you in summer and warms you in winter. It boils your coffee and freezes your ice. It brings real home-comfort at the click of a switch.

Don't stint on wiring, on convenience outlets, on switches or in the use of electricity itself. Put it up to an electrical contractor to place every nook and corner within easy reach of electricity's magic touch—and take your full share of the power that your power and light company keeps always on tap.

GraybaR
ELECTRIC COMPANY
SUCCESSOR TO SUPPLY DEPT
Western Electric

Graybar Electric Co., Executive Offices: 100 East 42nd Street, New York City

For reprints—apply nearest Graybar distributing house or Executive Offices, 100 E. 42nd St., New York. Offices in 58 principal cities.

Published in the interest of electrical development No. 85

Published in the interest of electrical development

ADVERTISEMENTS like this directed to home builders throughout the country help pave the way for the electrical contractor. Back of these advertisements stands Graybar and its great stocks of wire and conduit and other quality electrical supplies, made quickly available for all electrical purposes.

Arrived, bright and early! Two wasted footsteps, the first in a long weary line that's sure to cut down the usefulness of this big new building. We're not exactly conspicuous—yet. We never are; until after the owner considers the cost of the footsteps and the time his people waste running around needlessly. That, by the way, is when the contractor's suggestion to install Inter-Phones comes home the closest. And incidently, if the client profits, so does the contractor.

Just another wasted footstep? Yes, to be sure. But also another argument for putting Western Electric Inter-Phones into buildings, schools and offices. For we wasted footsteps can testify that Inter-Phones are the best way of getting rid of us—and the cheapest in the end. Inter-Phones carry a name that has stood for leadership and long experience in the field of electrical communication since the very beginning of the art. And step saving is an art.

But contractors needn't tackle us singlehanded. Graybar, distributor of Western Electric Inter-Phones, has specialists who help contractors take wasted footsteps out of good building plans.

It pays to install "Pittsburghs"

It pays the merchant who has you install them —and so it pays *you*.

The real test of a successful contracting business is the *satisfied customer*—the kind who has you come back to do more work because of a fine job already done.

Your "Pittsburgh" customers are pleased customers. Their reflectors *stay bright*. Our 5-year guarantee gives them full protection. You will like the Easy-to-Install conduit system.

The reflector shown above is our No. 100, one of a line of 39 silvered glass reflectors to meet every need in the lighting of show windows and other sales displays—for direct and indirect lighting, cove lighting, flood lighting, etc.

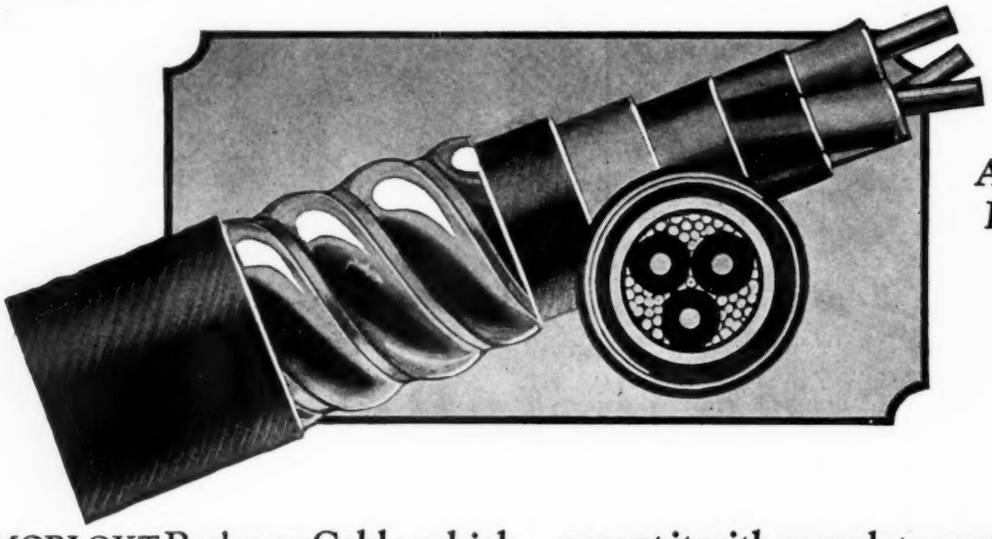
Have you our booklet, "Show Window Lighting?" If not, send for a free copy.

PITTSBURGH REFLECTOR COMPANY
(Formerly Pittsburgh Reflector & Illuminating Co.)
417 Bowman Bldg., 3rd and Ross Sts., Pittsburgh. Pa.
REPRESENTATIVES IN 26 LEADING CITIES.

It has now been more than ten years since we began using the coppering process of backing. Not one reflector made in all that time has ever been reported to us as having the silvered reflecting surface tarnish or discolor, or the backing crack, check or peel.

"Pittsburgh" Silvered Reflectors STAY BRIGHT

American Steel & Wire Company's PARK and SUBURBAN CABLES



Armorlokt Parkway Cable

ARMORLOKT Parkway Cable, which is now available, marks an important addition to A. S. & W. Cable service. This new type and the tried and tested Flat Steel Tape Cable provide equipment for every requirement.

Because the new Armorlokt Parkway Cable comes to you as an American product, carrying the critical endorsement of our staff of cable engineers, you can accept it with complete confidence. In design, materials and construction it meets the highest standards for which A. S. & W. products in every field are recognized.

You can *insure* satisfactory cable service at low cost by specifying one of these types. Complete information will gladly be sent you, on request.

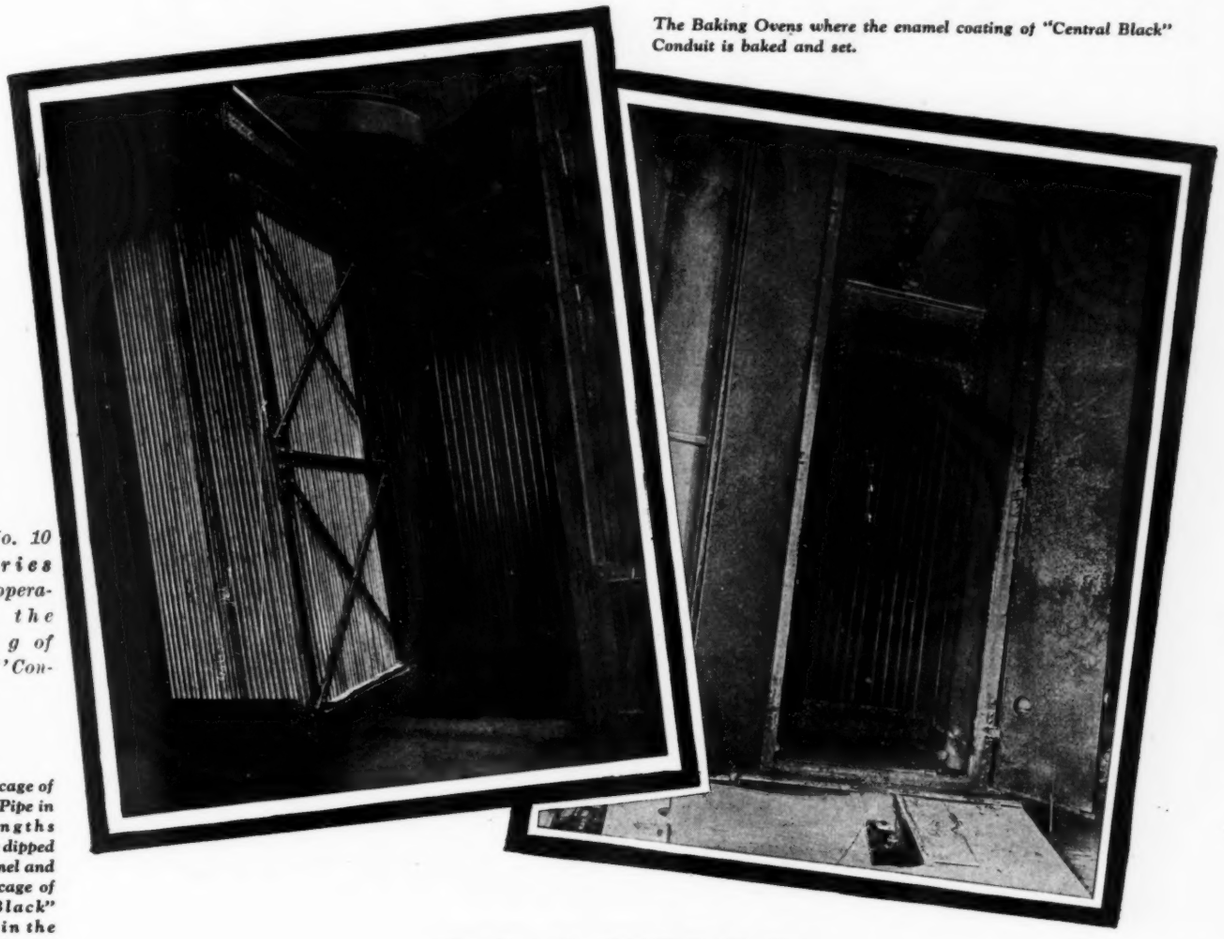
Flat Steel Tapes
Galvanized or Ungalvanized

Regularly supplied with Galvanized Steel Tapes (Plain Steel Tapes or all Zinc Tapes furnished on order)

SALES OFFICES

CHICAGO . . . 208 So. La Salle Street
CLEVELAND . . Rockefeller Building
DETROIT . . . . . Foot of First Street
CINCINNATI . Union Trust Building
MINNEAPOLIS—ST. PAUL . . . . . Merchants Nat'l Bk. Bldg., St. Paul
ST. LOUIS . . . . . 506 Clive Street
KANSAS CITY . . 417 Grand Avenue
OKLAHOMA CITY . . . . . First Nat'l Bank Bldg.
BIRMINGHAM . . Brown-Marx Bldg.
MEMPHIS . . . . . Union and Planters Bank Bldg.
NEW YORK . . . . . 30 Church Street
BOSTON . . . . . 185 Franklin Street
PITTSBURGH . . . . . Frick Building
PHILADELPHIA . . Widener Building
ATLANTA . . . . . 101 Marietta Street
WORCESTER . . . . . 94 Grove Street
BALTIMORE . . 32 So. Charles Street
BUFFALO . . . . . 670 Ellicott Street
WILKES-BARRE . Miners Bk. Bldg.
DALLAS . . . . . Praetorian Building
DENVER . . First National Bank Bldg.
SALT LAKE CITY . Walker Bk. Bldg.

UNITED STATES STEEL PRODUCTS COMPANY, San Francisco, Los Angeles, Portland, Seattle



The Baking Ovens where the enamel coating of "Central Black" Conduit is baked and set.

This is No. 10 of a series showing operations in the making of "Central" Conduit.

A loaded cage of "Central" Pipe in conduit lengths about to be dipped in the enamel and a loaded cage of "Central Black" Conduit in the enamel vat.

COATING "Central Black" *Conduit*

LOADED cages of pipe are carried on monorails over the dipping tank and by means of a hoist are immersed in the black enamel.

After enough enamel has been thoroughly absorbed, the cages of loaded pipe are withdrawn from the dipping tank and placed in a drying room to drain off excess enamel and to allow the coating to set.

From the drying room the cages go to the baking ovens. Here the enamel is baked for a certain period of time at a temperature that will cause it to set so that there will be no tackiness perceptible to the touch. The surface and interior are smooth, dry, and hard—impervious to both heat and moisture.

Tests are made daily to insure in "Central Black" the conduit qualities necessary for uniformity—ductility of pipe, appearance, thickness, and elasticity of coating.

CENTRAL TUBE COMPANY

PITTSBURGH, PA.

"XDUCT"
"ELECTRODUCT"

The Pinnacle of Perfection

The place at the top, the preferred position, has been accorded to "XDUCT" and "ELECTRODUCT" Rigid Conduit by discriminating electragists. These leading contractors have learned, from the fruits of experience, the superiority of these pioneer products.

"XDUCT" and "ELECTRODUCT" are made from perfect pipe, cleanly threaded and protected from corrosion; they represent the highest attainable quality in rigid conduit. They are found in the finest buildings everywhere and will continue to go into those installations where quality, service and permanence are paramount considerations.

We will be very glad to send you samples, upon request.

American Circular Loom Co.

90 West Street, New York

BOSTON PHILADELPHIA PITTSBURGH ATLANTA DENVER BUFFALO LOS ANGELES CHICAGO PORTLAND

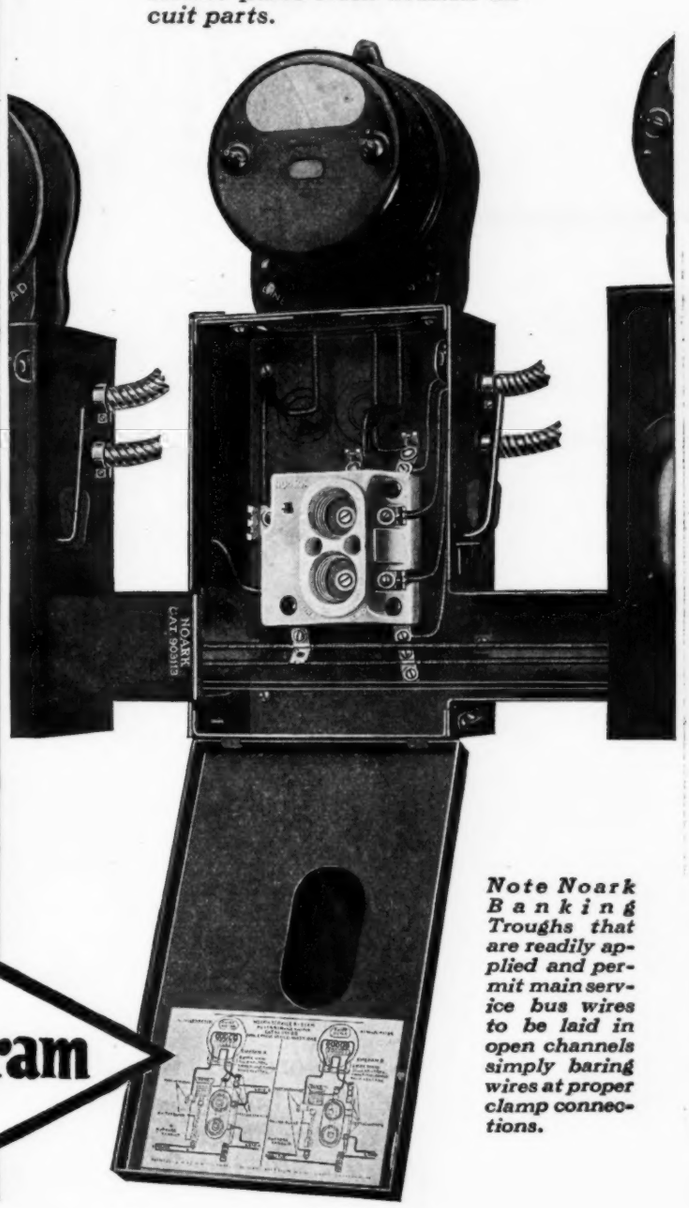
NOARK Meter Service System

Complete wiring diagrams are only a part of the manner in which the Noark Meter Service System makes it possible to do more service entrance jobs per day and to make more profit per job.

In the cover of each cabinet are complete diagrams of the various types of hook-up. You know what is on the service side, you know what is on the meter side and you know what you want on the load side. Look at the diagram that covers these conditions and go ahead with the wiring.

Just *follow* the Diagram

Noark Meter Service Switch No. 971123 (New Type) provides compact, rugged meter service and branch circuit control with great simplicity, unusual accessibility and better arrangement and segregation of main service parts from branch circuit parts.



Note Noark Banking Troughs that are readily applied and permit main service bus wires to be laid in open channels simply baring wires at proper clamp connections.

The Johns-Pratt Company

Division of Colt's Patent Fire Arms Mfg. Co.

New York
Boston

Hartford, Conn.

Chicago
San Francisco

NOARK

Noark Fuses "Blow on the Dot" | Noark Fuse Clips and Bases | Noark Service Boxes | Noark Underground Boxes | Noark Meter Service System | Noark Railway and Mine Material | J-P Molding Service on Contract Basis | Volcabestos Packing and Pump Valves | J-P Molded Auto and Radio Parts

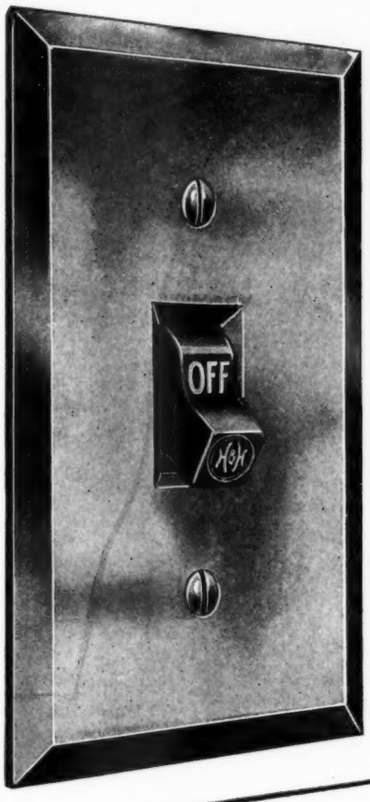
Reg. U.S. Pat. Off.
33-S-24

THE GARLAND trade mark is here repeated for purposes of emphasis—to indelibly impress upon the contractor's consciousness both the honorable record and outstanding superiority of "GALVADUCT" and "LORICATED" Rigid Conduit.

"LORICATED" is the pioneer conduit on the American market and "GALVADUCT" is the oldest brand of galvanized conduit manufactured in the United States!

—a record of which we are justly proud and one that holds us unswervingly to the standard of quality that has made "GALVADUCT" and "LORICATED" the preferred conduit with leading electragists.

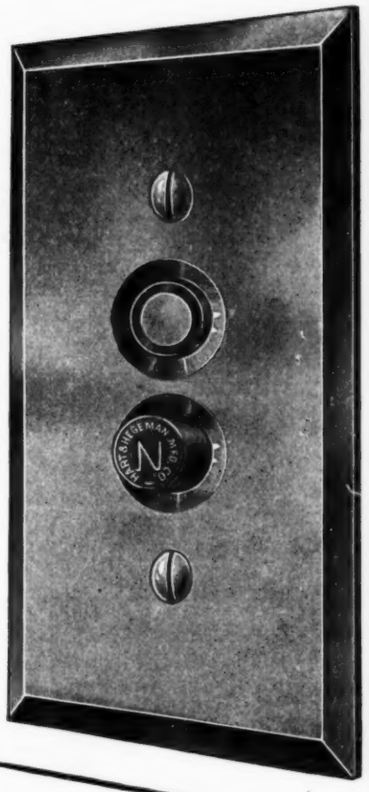
H&H FLUSH SWITCHES



NUTMEG
"4401" Shallow Push

TUMBLER
"8601" ~ Square

Competitive priced



Their Long Life *Saves the Life of Competitive-price Wiring Jobs*

FRIENDLY Switches — they back you up when you're up against the low-bid jobs. Help you in keeping down to a price without cutting down the permanence of your work.

NUTMEG "Push" you know of old; its low price has never denied you dependable *mechanism*. Its sturdiness, through the years, has been priceless.

For your newer needs in a *Tumbler:*—8601 Square; sister switch to NUTMEG. Like NUTMEG it stands at the head of its price-class, because it stands out from that class mechanically.

These switches couldn't help but share the craftsmanship in the H&H higher-priced jobs. So share it all you can in your *own* jobs.

THE HART & HEGEMAN MFG. CO. HARTFORD, CONN.

Makers of Electric Switches since 1891

DURAFLEX

Reg. U. S. Pat. Off.

The real ol' able cable—it's Safe

O.K.'d

by the Electrical Trade

You've got to
have the goods
to make good
with the Electrical Trade

Dura Bill

It's one of the Durabilt Products

made by the Tubular Woven Fabric Co., Pawtucket, R. I.

EXAMINE

this

Bryant No. 121 Receptacle and Warning Signal

The lamp lights when the plug is inserted.

It is well protected by a metal cover.

No. 121 is easily wired. The terminals are strong and accessible.

It is ruggedly built for long service. It fits a standard one gang outlet box. The "Spartan" outlet takes any standard attachment plug. When its advantages are shown it sells readily and is a money maker for the dealer.

When an appliance is unintentionally left with the current on it wastes electricity, injures the equipment, and may start a fire. The warning signal of Bryant No. 121 device shows a light when the current is on the circuit.

NATIONAL ELECTRICAL CODE STANDARD.

The lamp for this device is our No. 618 for 125 Volts or No. 619 for 32 Volts.

These lamps have clear tubular bulbs, carbon filament, candelabra base.

THE BRYANT ELECTRIC COMPANY

1421 STATE STREET, BRIDGEPORT, CONN.

NEW YORK - *342 Madison Avenue*
CHICAGO - *884 West Adams Street*
SAN FRANCISCO - *149 New Montgomery Street*

BRYANT
SUPERIOR WIRING DEVICES

The largest plant in the world devoted exclusively to the manufacture of Electric Wiring Devices.

New! The HUBBELL "Tip-Top" SWITCH

"IT'S a wonderful switch for the money!"

This, in substance, is the enthusiastic opinion that we are hearing everywhere.

So we have named this new switch the Hubbell "*Tip-Top.*" *It's a tip-top* switch at a *popular* price!

Write to us for a sample. See how smooth and positive in action the Hubbell "*Tip-Top*" Switch is—how well and strong it is made. Convince yourself.

[*No. 8801, Single Pole: List Price....35 cents*
No. 8803, Three-way: List Price....50 cents]

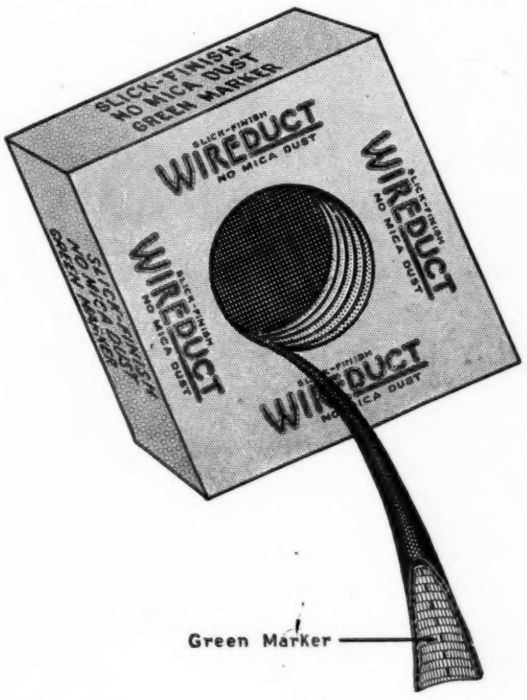
HUBBELL
REG. U.S. PAT. OFF.

HARVEY HUBBELL INC.
ELECTRICAL SPECIALTIES
BRIDGEPORT, CONNECTICUT, U.S.A.
NEW YORK, N.Y. CHICAGO, ILL.

A FINE SWITCH AT A POPULAR PRICE!

At Last!

Loom with a "Slick-Finish" Clean to Handle



NO MICA DUST

Slick as Ice
Clean as a Whistle

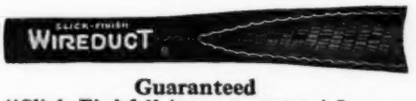
Improved Quality
No Extra Cost

Loom is Loom
But -- "Slick-Finish"
Makes Wireduct Different

THE WIREMOLD COMPANY

Makers of

Guaranteed
Surface Conduit System
Underwriters' Label



Guaranteed
"Slick-Finish" (Patent Applied For) **Loom**
Underwriters' Label

Guaranteed
Non-Metallic Sheathed Cable
Underwriters' Label

At Hartford, Connecticut, U. S. A.

TEAR OFF COUPON AND MAIL TODAY

THE WIREMOLD COMPANY, HARTFORD, CONNECTICUT

Please send me sample of WIREDUCT showing the superior Single-Wall construction with the "Slick-Finish".

Name.....

Address.....

.....

Clean threads Save time

The New Thread Protector!

A short cut to a better installation-- ALWAYS

For a Secure, Tight-Fitting Conduit System

EVERY thread sharp, clean and true—that's the story in brief of this new improved Thread Protector on Pittsburgh Standard Enameled Conduit. It is virtually a policy of insurance on every length of this Enameled Conduit.

For Pittsburgh Standard reaches the job ready to install—its new Thread Protector assures that. Yet it costs no more than ordinary enameled conduit.

The Metal Cap reinforces the fiber protector, keeps it in place. It's off in a twinkling when desired. It means clean threads, quick installation, a tight-fitting secure conduit system.

And the permanent baked enamel elastic coating of Pittsburgh Standard is assurance of conduit durability. Its smooth finish makes fishing easy; its permanence means utmost protection.

On your next job let Pittsburgh Standard help you keep work ahead of schedule, help you gain the satisfaction of an installation well done.

Enameled Metals Company
PITTSBURGH, PA.

Fittings Built *for* Contractors

V. V. Fittings are designed to make your jobs better, your work easier and more profitable. For instance V. V. Fittings replace twenty-one of other make, as they are reversible in position, have larger openings and have variations of cover applications.

In figuring a job with V. V. you do not need to check right or left, for one fitting does for both. No left-overs after the job is finished. Take V.V. Type I—it replaces Types A, B and B E, this one fitting replaces three! All through the V. V. Line there are similar practical characteristics that make each fitting fill two or more requirements. You will find them built as though to your order, easy to buy, more quickly installed, and of greater profit in the end.

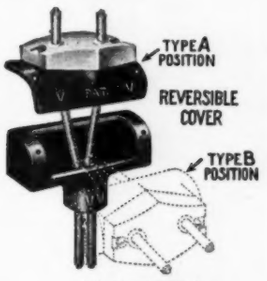
V. V. Fittings are stocked nearly everywhere. Send for complete catalog and information. Free, of course.

V. V. FITTINGS COMPANY

Philadelphia, 711 Cherry St. Chicago, 710 W. Jackson Blvd. New York, 50 Church St.

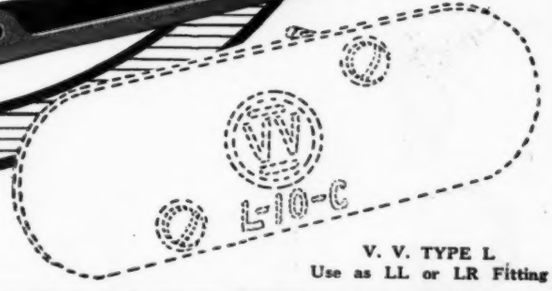
V.V. FITTINGS

Distinctively Different

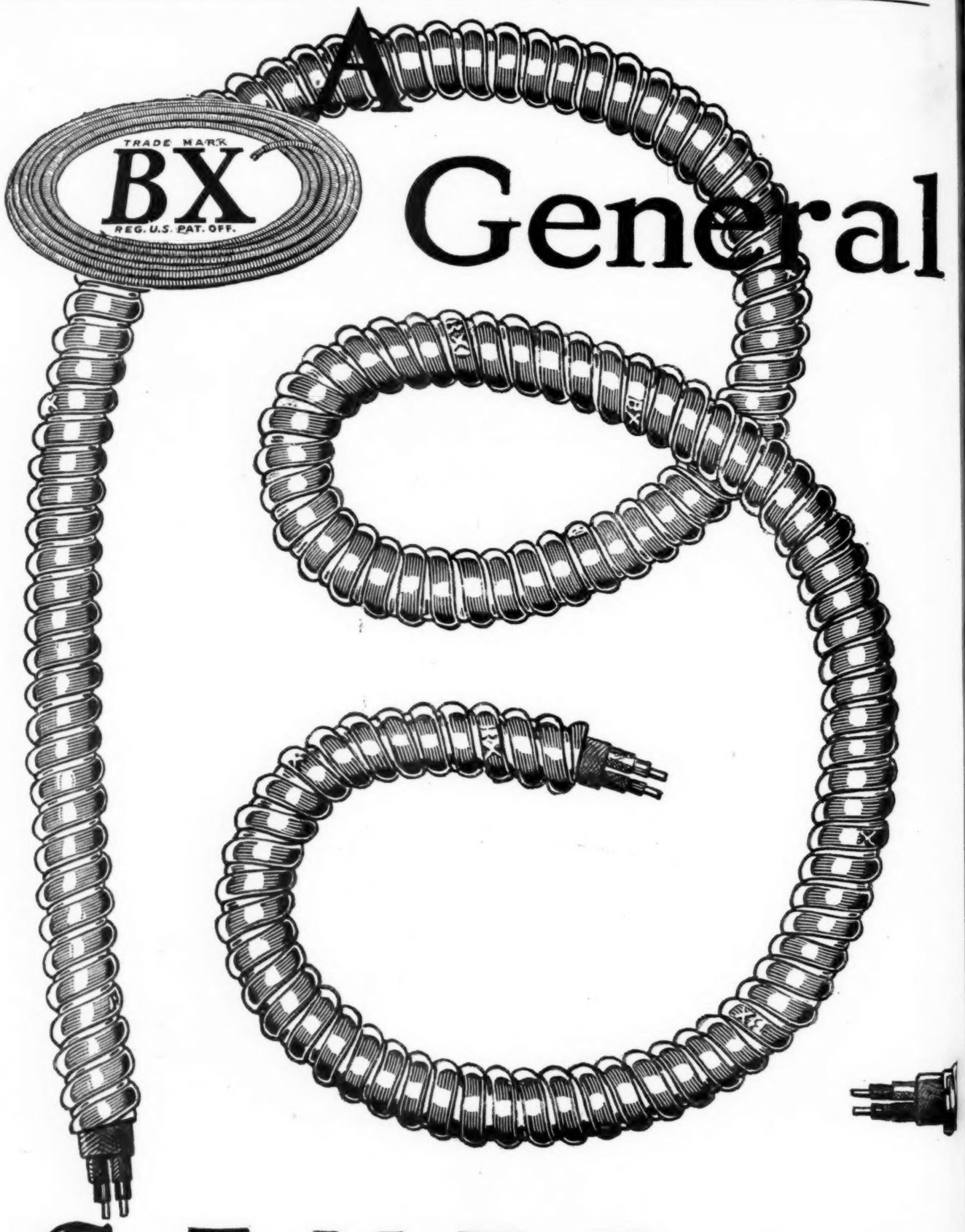


V. V. TYPE I
This fitting serves the purpose of a Type A, Type B or Type BE Fitting by means of the reversible cover. Note the straight pull on wire and double size opening.

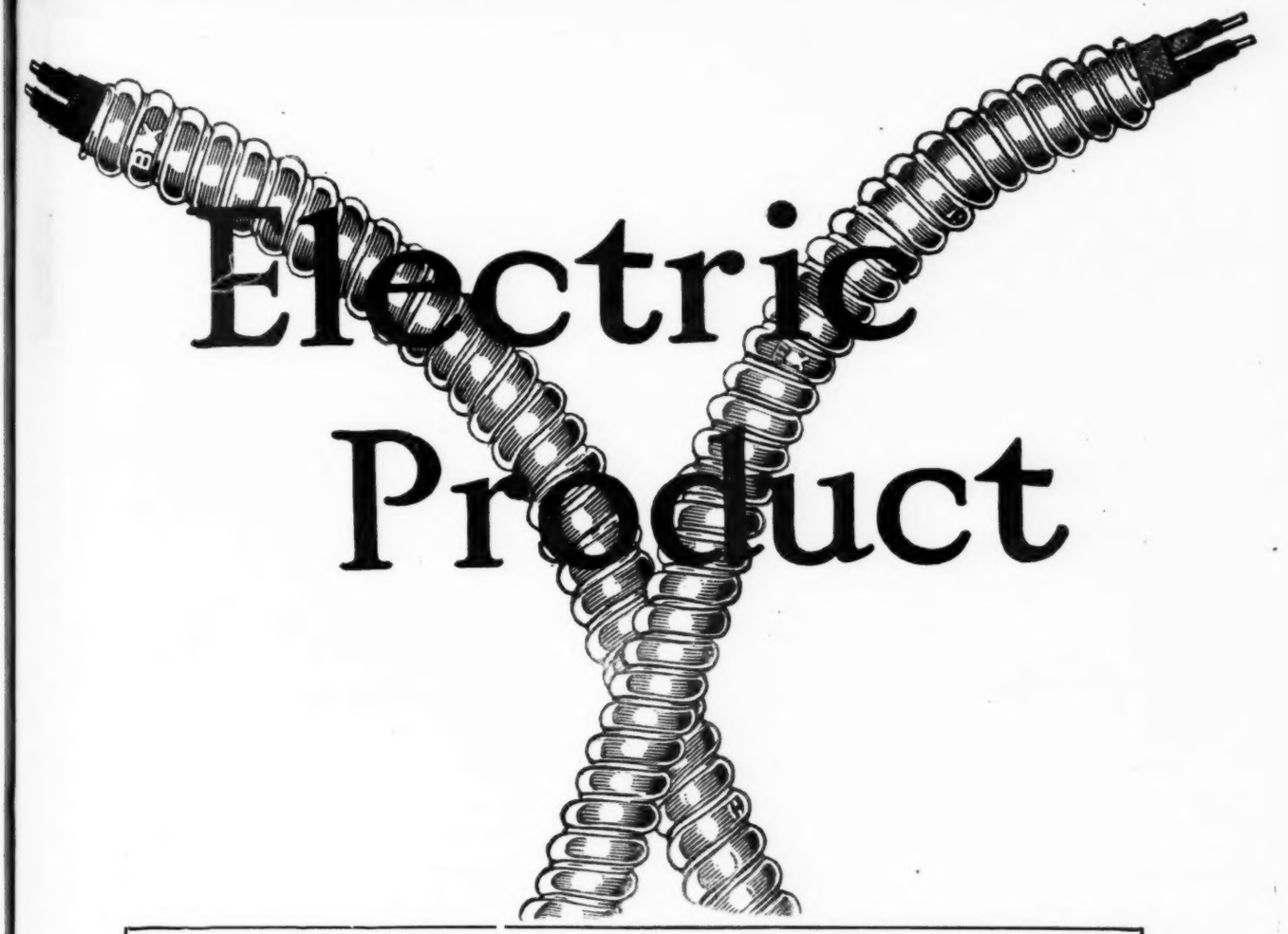
TYPE LFB
Here is V.V. Type LFB. You need only this in place of Type LF and Type LB.



V. V. TYPE L
Use as LL or LR Fitting



GENERAL ELECTRIC COMPANY.



Electric Product

There is only *one* "BX"

In some quarters there is an impression that all flexible steel armored conductors are "BX"—but

There is only *one* "BX"—the Flexible Steel Armored Conductor manufactured by the General Electric Company, the first product of this type on the market, the standard for over twenty-five years.

"BX" is a registered trade mark of the General Electric Company. Look for these letters, stamped at frequent intervals on the armor. See, also, that the distinctive orange and blue label is attached to each coil. Then you can be *sure* you are getting the genuine "BX".

"BX"—the trade mark of a G-E product

46—241

ELECTRIC

MERCHANDISE DEPARTMENT, BRIDGEPORT, CONNECTICUT

FPE

No. 933

SPE

FPD

SPD

ARROW

now offers a complete line of porcelain fittings.

Bodies for 2¼ and 4 inch shades.

Deep back wall and ceiling bases for all types of outlet boxes, with and without attachment plug outlets.

The cuts shown are only typical of the line, the many combinations gives a wide selection of complete fittings.

FPC

SPA

No. 942

SPC

No. 981

No. 936

No. 947

No. 980

ELECTRICAL ARROW WIRING DEVICES

Come Across in the Pinches

Don't send customers away to your competitors by the time-worn saying "I haven't got that fitting in stock, but I can order it for you."

Install a line of Adaptiboxes, the flexible, easily installed, permanent conduit fitting, and Adapti Outlets. Then you can make up, in a moment, any special type to meet wiring emergencies.

You won't require a large inventory and your turnover will be rapid. Send for the Adapti Catalog and prices today.

ADAPTiBOXES

The ADAPTi Co.

Cleveland, Ohio

NEW YORK
A. J. Bressan Co.
30 Church St.

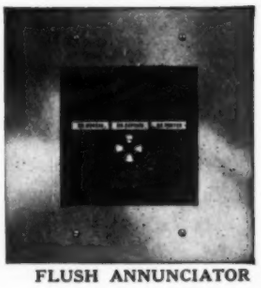
CHICAGO
Daniel Woodhead Co.
15 N. Jefferson St.

SO. BOSTON
The Hastings Elec. Sales Co., 42-50 Binford St.

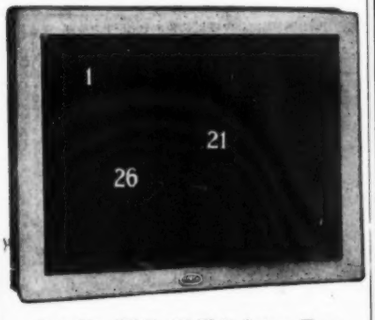
Auth (AUTH) Products

Cat. No. 200
HOSPITAL
BED PUSH

For Low Tension Installations


FLUSH ANNUNCIATOR

FLUSH
TELEPHONE



Cat. No. VLT—110-Volt Lamp Type
HOSPITAL ANNUNCIATOR

Cat. No. PD-2
SOLID BRASS DESK PAD

WRITE FOR CATALOGUE

Auth Electrical Specialty Co., Inc.

422-430 E. 53rd Street NEW YORK, N. Y.

LAMPS DON'T BREAK

with the

TAPLET

CUSHION FIXTURE HANGER

These are standard for all ½" and ¾" Oblong Taplets and will take ⅜" or ½" stems.

Cat. No. 18H

They make a flexible hanger to take up lateral vibration and the flexible spring relieves the vertical vibration from the building.

Suitable springs can be supplied for fixtures with total weight of 2½ to 5 lbs.

Catalog and sample upon request.

Taplet Manufacturing Co.

3911 Powelton Avenue, Philadelphia, Pa.

Wise builders specify Arrow Cable

Architects and Contractors know the value of good Armored Cable and Flexible Conduit.
The purchasers often leave the matter of wiring an electrical equipment to his contractor.
The wise builders and contractors specify Arrow Armored Cable and Flexible Conduit.
They know Arrow means satisfaction.

ARROW
FLEXIBLE CONDUIT CO.
119-121 Bleecker Street, New York

"HERCULES"

Guarded Fixtures

Here is just the fixture you need for installations in gymnasiums, play-grounds, factories or wherever a REAL guarded fixture is needed.
Strong, sturdy and quality-built, the **HERCULES** will withstand the "hard-knocks" of rough usage, and stick right on the job.
Easy to install (to any type of ceiling), easy to clean and to re-lamp. Made of steel bronzed or solid brass, with steel reflector or enclosing globe.
We will be glad to cooperate with the contractor. Write us for full information.

Jaehnig Lighting Fixture Co., Inc.
221 Thirteenth Ave., Newark, N. J.

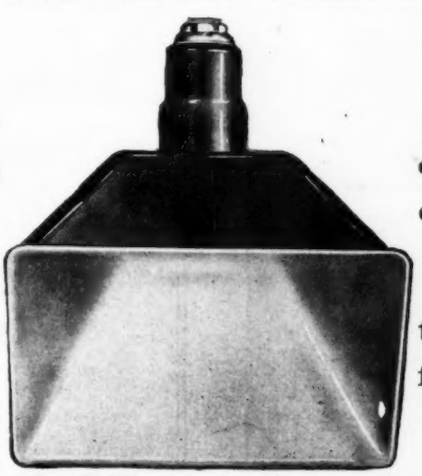
FOR SIGNS—

Spot Light or Even Light?

This is a simple thesis. Round reflectors on sign boards produce spotted effects. Rectangular reflectors distribute light evenly over the entire surface. There are no high lights and shadows—just full brilliance throughout.

The only rectangular reflector is the **Wheeler Isolux**, patented.

Isolux is specified exclusively by the largest sign companies.



Isolux reflectors are made of steel, heavily porcelain enameled.

Isolux is easily wired—two-piece socket and yoke fitted for ½ or ¾ inch pipe.

"Rectangular Reflectors for Rectangular Signs!"
Write for Bulletin 23-C
WHEELER REFLECTOR CO., 275 Congress Street, Boston, Mass.

TRUMBULL

New 4 Circuit Residence Panel

Every new home which is wired to care for the constantly increasing electrical requirements needs a residence panel.

This is shown by the fact that all Wiring Systems in which the CONVENIENCE to the USER is considered call for such a panel to be placed where an inexperienced person can easily locate and renew fuses.

ARE YOU USING RESIDENCE PANELS ON YOUR WIRING JOBS?

You will find that "CIRCLE T" PANELS can be installed at a saving over the old style cutouts mounted in an iron box on the job, so why not give your customer this convenience?

Besides the new 4 circuit Panel, "Circle T" offers the regular line, 4-14 circuits, now mounted on unbreakable composition bases.

No. 3104
4 Circuit Panel
(Porcelain Base)

Net Price to Contractor, $1.88 each for No. 3104.

Send for Circular No. 66.

THE TRUMBULL ELECTRIC MFG. CO.

PLAINVILLE, CONN.

NEW YORK CHICAGO BOSTON
JACKSONVILLE PHILADELPHIA SAN FRANCISCO

SAYLORDUCT

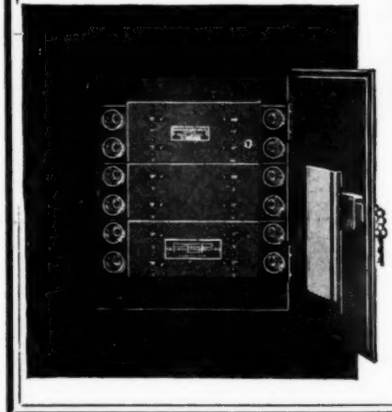
SAYLOR DUCT TRADE MARK

SAYLORDUCT

NON-METALLIC FLEXIBLE CONDUIT

Race-Way is as Straight as an Arrow
Can Not Be Beat for Fishing

SAYLOR ELECTRIC & MFG. CO.
Detroit, Mich.



Switchboards
Panelboards
FuseReducers

THE PLAINVILLE ELECTRICAL PRODUCTS CO.
PLAINVILLE, CONN.

THE PAINE FIXTURE HANGER

The latest improvement for hanging fixtures in old houses.
Eliminates: Backing Board
Hanging Board Crowfoot
Wasted Installation Cost

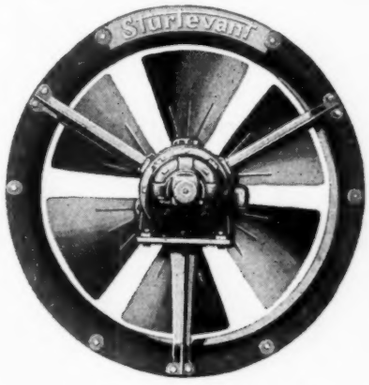
THE PAINE FIXTURE HANGER consists of two wings mounted on a ⅜" nipple 2½" long with key in nipple that locks the wings in open position. The wings have a spread of 11" and can be inserted through a 1⅛" hole. **Well constructed** and **strong.**

Approved by the Underwriters' Laboratories, U. S. A., also by the majority of local Electrical Inspectors.

Sold everywhere. Order **now** through your jobber. **Send for descriptive Bulletin 29.**

PAINE HANGERS

THE PAINE COMPANY, 2951 Carroll Avenue, CHICAGO, ILL.
New York Office: 33 Warren St., New York, N. Y.



BUILT in a wide range of sizes in both D.C. and A.C. types.

Quick service—prompt shipment from nearby Sturtevant or Graybar stock.

B. F. STURTEVANT CO., Hyde Park, Boston, Mass.
Branch Offices in Principal Cities
Distributor: Graybar Electric Company

Sturtevant
(REG. U. S. PAT. OFF.)
Ventilating Fans

WIRES AND CABLES
RUBBER INSULATED

A-A CODE A-A 30%
A-A RED
(Intermediate)

Specified By Leading Architects and Engineers

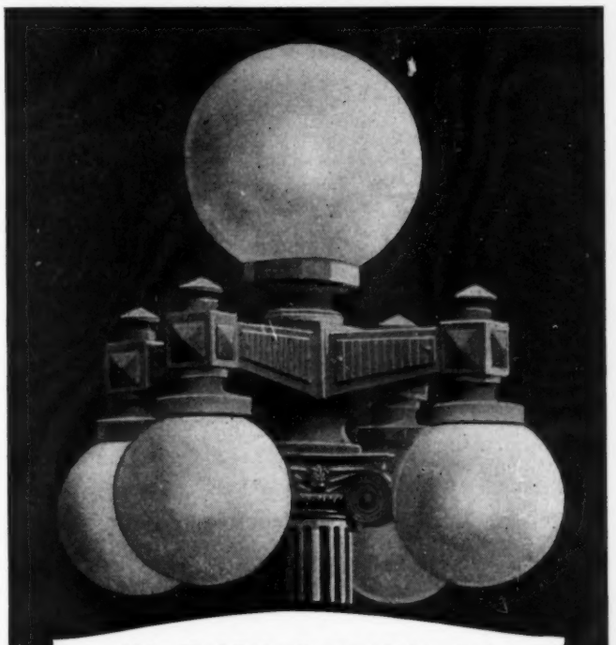
A-A WIRE CO., Inc.
114 LIBERTY ST.
NEW YORK

ATLANTIC
INSULATED WIRES

NEPTUNE ATLANTIC · DOLPHIN ATLANTIC · TRITON ATLANTIC

Including all types of rubber covered, and rubber covered lead encased wires and cables, bare wire, magnet wire, and flexible cords.

Atlantic Insulated Wire & Cable Company
Rome, N. Y.



Union Metal Design No. 759—5 Lights. Design No. 839—3 Lights. One of hundreds of styles.

Take Advantage of a Growing Market

Every large home, church, apartment, or public building which goes up, is an opportunity for you to sell Union Metal Exterior Lighting Fixtures. More and more, architects are specifying this material and with the most complete line, this business can just naturally come to you.

The market is steadily growing—almost unlimited. Private Estates, garages, filling stations, bridges, all swell the volume of orders.

Send for Catalog No. 54 and our best sales proposition. It will prove mighty interesting to you.

THE UNION METAL MANUFACTURING CO.
General Offices and Factory, Canton, Ohio
Chicago Office—230 South Clark Street

UNION METAL
EXTERIOR LIGHTING FIXTURES
Entrance Standards Brackets · Newels

Another Good Man Has a Good Job!

The happy man up there has just grabbed a good job; he is catching the train to his new city. No wonder he's happy—it's a good job in a good city.

He got the job through THE MARKET PLACE section of *The Electragist*. Somebody wanted a good man. With wise judgment somebody told the electrical contracting field about it through the classified section of the contractors' magazine, *The Electragist*.

This well-trained, experienced man was looking for a better job. He answered the advertisement in THE MARKET PLACE and answered it so well that his application was the final choice.

You, too, can get a job through THE MARKET PLACE. It costs very little to tell the electrical contractors the kind of job you want and the kind of man you are. *The Electragist* will take your message to all of the leading contractors.

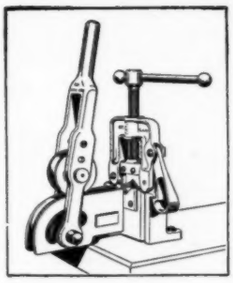
Or if you want a good man to fill your vacant position—tell about it in THE MARKET PLACE. *The Electragist* will take your message to well-trained, experienced, wide-awake men, at low cost.

Just give us a description of your want. We will help you write it in forceful, result-pulling language. Write to:

THE MARKET PLACE
of
THE ELECTRAGIST

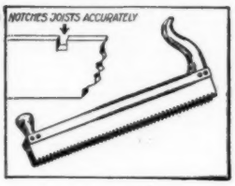
15 West 37th Street **New York City**

"Jiffy" Pipe Bender Vise



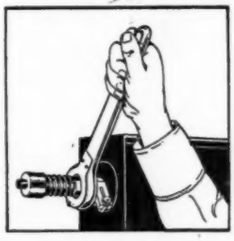
Bends ½" and ¾" conduit, quickly and easily without flattening, kinking or splitting the pipe. Absolute accuracy in measurements. Any workman can operate.

"Jiffy" Joist Notcher



Cuts slots for ½" and ¾" conduit in one operation. Depth gage prevents weakened joists. Weighs only 2 lbs. Pays for itself on one job.

"Jiffy" Cutter



Cuts clean round holes in steel boxes or switchboard panels, quickly and easily. Any diameter ¾" to 6". Weighs only 4 lbs.

Any "Jiffy" Tool may be ordered on approval. Write for our complete catalog.

PAUL W. KOCH & COMPANY

Originators of the "JIFFY" Line of Labor-Savers.

25 South Wells Street, CHICAGO

SELECT STAR HACK SAW FOR YOUR HARDEST CUTTING JOB

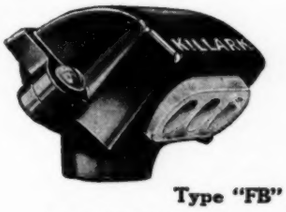
In almost every country on the globe Star Hack Saw Blades are doing the hardest cutting jobs and are becoming internationally known as a solution to many cutting problems.

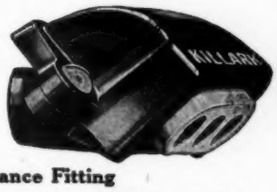
Write us of your requirements and let us send you sample blades that will do the job.

CLEMSON BROS., Inc., Middletown, N. Y.

Makers Since 1883—Star Hack Saw Blades

ELECTROLET Conduit Fittings





Type "FB" Entrance Fitting

On a Vertical Conduit On a Horizontal Conduit

Killark ***Electrolet*** Fittings for exposed conduit are made in all the usual types required by electrical contractors, and in all sizes from one-half inch to four inches. Each type meets a need, and is dependable.

Send for booklet and prices.

KILLARK ELECTRIC MFG. CO.

3940 Easton Ave., St. Louis, Mo.

—For A 100% Job!

Ask your Jobber for OKONITE TAPE!

THE OKONITE COMPANY
THE OKONITE-CALLENDER CABLE COMPANY, INC.
Factories: Passaic, N. J. - - - Paterson, N. J.
Sales Offices: New York Chicago Pittsburgh St. Louis
Atlanta Birmingham San Francisco Los Angeles Seattle

MINERALLAC HANGERS

FOR CABLE AND CONDUIT

These hangers are made of spring steel and are much stronger than cast iron hangers for the same purpose. They are easily and quickly put in place, and open wiring, conduit and cable may be run with greater rapidity and more compactly arranged than by the use of other hangers.

MINERALLAC JIFFY CLIP

Made to meet the demand for a substantial clamp for hanging pipe, conduit and lead covered cables. With this clip only one screw or bolt is required to hold the pipe, conduit or cable and clip firmly in place. It is made to afford great strength without being heavy or bulky, by having a rib drawn in the center of the clip. Galvanized finish only.

MINERALLAC ELECTRIC COMPANY

1045 Washington Blvd., CHICAGO

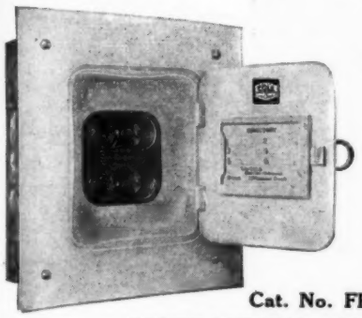
INSULATED SAFETY WIRES & CABLES

Insulated wire and cable for every transmission purpose—not made to meet a price, but with the idea of rendering maximum service to the purchaser and of reflecting maximum credit to the contractor who uses it.

Safety Cable Company

114 Liberty Street
N E W Y O R K

COLE FUSE PANELS



Cat. No. BFP4
Contractors
Cost only
$1.50
Complete

Cat. No. FP4

CONTRACTORS' NET PRICES

No. of Circuits	Galvanized Box White Trim	Black Box Black Trim
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3	Cat. No. FP3 $1.75	Cat. No. BFP3 $1.20
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The smallest 6-ampere pull chain switch made. Installed on either old or new fixtures without changing their length. The Levolier Link Switch is used between two links of chain on lighting units having small canopies. Resembles a link of chain—hardly noticeable after installed. Takes the place of the "sore thumb" and pendant switch and is a lot less expensive in original cost and in installing. No extra wires are needed.

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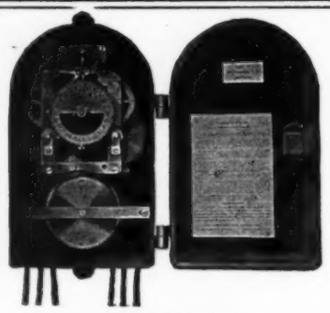

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Every person connected with your business should read every issue of this publication—

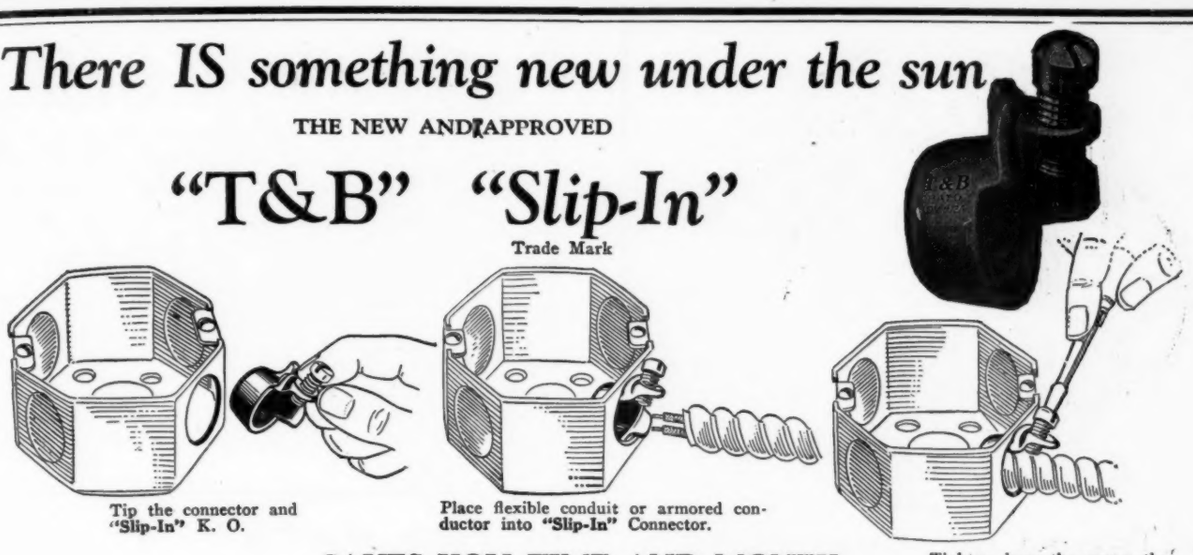
For Profit

There IS something new under the sun

THE NEW AND APPROVED

"T&B" "Slip-In"

Trade Mark



Tip the connector and "Slip-In" K. O.

Place flexible conduit or armored conductor into "Slip-In" Connector.

Tighten down the screw—the one and only operation.

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After years of experimenting and of practical testing The Thomas & Betts Co. now presents to the electrical trade a new and approved ⅜-inch connector which has the following features:

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3rd. **JUST ONE OPERATION.** To install tighten down the screw.

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We are one of the world's largest builders of this type of equipment—a complete and a quality line. We are ready to work with you. Write us for full information.

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IT'S EASILY STRIPPED
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Parkersburg, West Virginia

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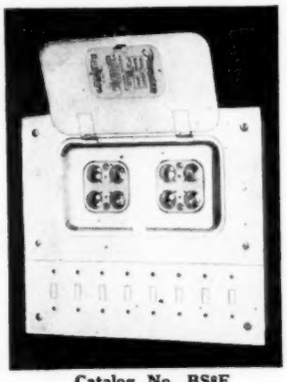

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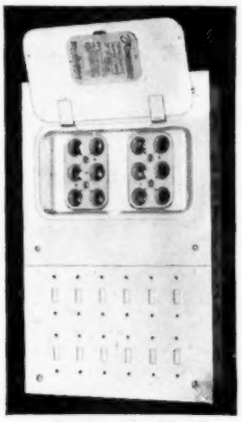
Price $9.00



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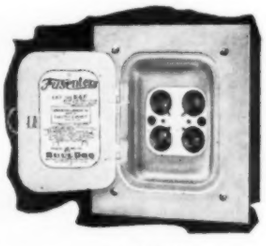
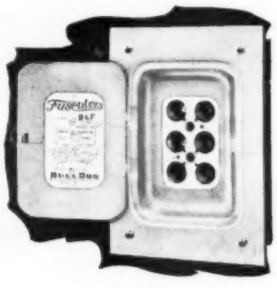
New! 8 and 12 Circuit Bull Dog Fusenters with Plates Punched for Toggle Switches



4 Circuit
Catalog No. B4F



6 Circuit
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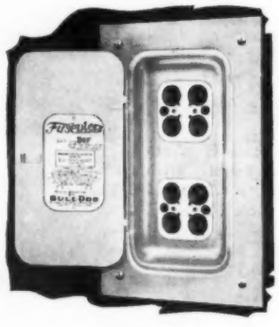

8 Circuit
Catalog No. B8F
Also 12 Circuit
Catalog No. B12F

Constantly developing new improvements for better electrical control, Bull Dog now offers 8 and 12 circuit as well as 4 and 6 circuit Fusenters with plates punched for toggle switches.

The Bull Dog campaign on "Take it Out of the Cellar" has already greatly advanced electric wiring, making for safer, more convenient and more satisfactory installations. Bull Dog is always a step ahead with new products. Watch for future announcements.

Bull Dog Products include a complete line of safety switches, panel boards and switchboards for every requirement of electrical control.

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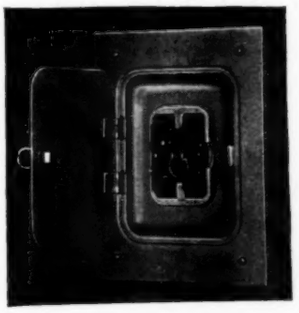

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